J. OTHER GCVTC RECOMMENDATIONS

1. Regulatory History and Requirements

The recommendations of the GCVTC are presented throughout the June 1996 final report with varying degrees of specificity. Not all are included in the Regional Haze Rule. However, some of the recommendations were intended as a menu of options, with no expectation that any geographic area would implement all of them. The GCVTC pointed out in its final report that:

> "Some of the Commission's recommendations ask the EPA to take specific **actions** or institute particular **programs**, in cooperation with the tribes, states and federal agencies as implementing bodies. Other recommendations provide a range of potential policy or strategy **options for consideration** by the EPA and implementing entities. As the EPA develops policies and takes actions based on this report, this distinction between "actions" and "options" should be maintained with diligence. That is, recommendations intended as policy options should not become mandated actions or regulatory programs." [**BOLD** emphasis in original.][1]

2. Other State of Utah Long-term Strategy Components

(a) Evaluation of additional Grand Canyon Visibility Transport Commission recommendations. Pursuant to 40 CFR 51.309(d)(9), Utah has evaluated the "additional" recommendations of the Grand Canyon Visibility Transport Commission, to determine if any of these recommendations can be practicably included in this implementation plan. Utah reviewed the GCVTC's 1996 report, *Recommendations for Improving Western Vistas*, to identify those recommendations that were not incorporated into Section 309 of the Regional Haze Rule. This evaluation is described in Appendix K of this section.

(b) Implementation of Additional Recommendations. Based on the evaluation made by the State of Utah, as described in Appendix J of this section, no additional measures have been identified as being practicable or necessary to demonstrate reasonable progress. *Report to the Environmental Protection Agency and the Public to Satisfy the Requirements of 40 CFR 51.309(d)(9)* includes a complete list of all additional recommendations and their status.[2] This report reviewed and updated if necessary in 2008, 2013, and 2018.

K. PROJECTION OF VISIBILITY IMPROVEMENT ANTICIPATED FROM LONG-TERM STRATEGY

The Western Regional Air Partnership performed extensive analysis and modeling in order to determine the impact of the regional haze program on visibility at the 16 Class I areas on the Colorado Plateau. This work was performed by several contractors under the direction of various

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[1] *Recommendations for Improving Western Vistas*, page i.

[2] Utah Division of Air Quality. *Report to the Environmental Protection Agency and the Public to Satisfy the Requirements of 40 CFR 51.309(d)(9)*. Salt Lake City, Utah. December, 2003.

technical and policy forums of the WRAP.

This work began with development of a comprehensive inventory of emissions throughout the region for all categories of sources. In addition, econometric models and new technology profiles were used to project changes in those emissions over time that are expected from implementation of current requirements under the CAA. The Wrap also estimated emission changes resulting from the programs contained in the long-term strategy for regional haze under 40 CFR 51.309.

The emission inventories and projections were used by the WRAP Regional Modeling Center to estimate aerosol concentrations and visibility at each of the 16 Class I areas. WRAP also developed estimates of aerosol concentrations and visibility for the non-GCVTC Class I areas. The WRAP Regional Modeling Center used the Community Multi-scale air Quality (CMAQ) model to estimate aerosol concentrations from the emission inventories and projections.

The WRAP developed a Technical Support Document (TSD) that contains detailed descriptions of the emissions inventory and projection methods as well as the air quality modeling techniques and results. The following sections contain an overview of the projected changes in emissions and visibility resulting from the implementation of he Regional Haze Rule.

1. Effect on Emissions of Long-term Strategy Components

a. Inventory Methodology and Scope

The base WRAP emission inventories used for assessment of visibility included the following pollutants:

- Volatile Organic Compounds (VOCs);
- Oxides of Nitrogen (NO_X);
- Carbon Monoxide (CO);
- Sulfur Dioxide (SO_2);
- Particulate Matter smaller than 10 microns (PM_{10});
- Particulate Matter smaller than 2.5 microns ($PM_{2.5}$); and
- Ammonia (NH_3).

For visibility modeling, the PM2.5 emissions inventory was broken into components, or species, representing the key visibility impairing species of interest. This breakdown is necessary since each component has a different effect on visibility. These $PM_{2.5}$ species are organic carbon particles (OC), elemental carbon particles (EC), other fine particles such as soils and dusts. The factors used to allocate $PM_{2.5}$ into its components are based on source specific speciation factors. In addition, the coarse material (CM) fraction of PM_{10} (i.e., PM_{10} minus $PM_{2.5}$) was also computed, since coarse particulate matter has a different effect of visibility than fine particulate matter.

The geographic domain for the inventory included the 22 states west of the Mississippi River, and portions of Mexico and Canada. A detailed base year emission inventory was developed for 1996 and included emissions from all of the following categories of sources:

- Area Sources;
- Stationary Point Sources;

- Mobile Sources (both on-road and non-road);
- Road Dust (both from paved and unpaved road surfaces);
- Fire Emissions (agricultural burning, prescribed fire, and wild fire); and
- Biogenic Sources.

In addition to the 1996 base year emission inventory used for model validation, a projected base year emission inventory for the year 2018 was developed from the vase 1996 invenotry and other information related to growth and technology issues. A detailed discussion of the emission inventories and projections is contained at the beginning of Chapter 1 of the wrap TSD. This 2018 base case emission inventory was then modified to reflect the impact of the additional regional haze control strategies required by the Regional Haze Rule. This is referred to as "Scenario 2" in the WRAP TSD, and as "2018 w/309" in the tables below.

UDAQ staff reviewed the Utah emission inventory for consistency and provided feedback to WRAP on areas of the inventory that should be improved in the future. UDAQ staff concluded that the 1996 inventory was adequate for regional haze modeling given the uncertainties in any emission inventory process. UDAQ staff also reviewed the 2018 emission growth and projection factors used to develop the 2018 inventory and found the projection to be within the range expected from long range economic projections.

b. Projected Changes in Emissions for Utah

The changes in overall emissions for the State of Utah are summarized in Table 20. As shown, emissions of sulfur dioxide are expected to decrease by 2% by 2018. This reduction is due primarily to the long-term strategy for stationary sources of sulfur dioxide described in Part E that will generate a 16% reduction in emissions from stationary sources by 2018. Also, emissions of oxides of nitrogen and volatile organic compounds are expected to decline by 25% and 29%, respectively, due to the implementation of new federal engine standards and fuel standards described in Part F. Table 21 shows similar emission reductions for the nine-state GCVTC region, except that regionally, sulfur dioxide emissions will be reduced by 22%. The reason Utah's reduction of sulfur dioxide is smaller than that in the nine states is that the level of pollution controls on facilities is better than that in several other states. The detailed county-level emission inventories for the entire WRAP region are included in the WRAP TSD.

Table 20. Summary of the Change in Emissions from 1996 - 2018 for Utah Sources

(000s of Tons per Year)

	VOC	NOx	SO_2	$PM_{2.5}$*	CM
1996	172.2	269.6	66.8	85.4	63.7
2018 w/309	122.4	202.7	65.6	87.3	71.6
% Change	-29%	-25%	-2%	2%	12%

*$PM_{2.5}$ includes organic carbon, elemental carbon, and fine soils/dusts.

Table 21. Changes in Emissions from 1996 – 2018 for 9 GCVTC States

(000s of tons per year)

	VOC	NOx	SO_2	$PM_{2.5}$*	CM
1996	3,325.3	3,952.1	1,036.3	1,196.7	1,170.6
2018 w/309	2,339.2	2,691.8	808.9	1,228.3	1,198.4
% Change	-30%	32%	-22%	3%	2%

*$PM_{2.5}$ includes organic carbon, elemental carbon, and fine soils/dusts.

2. Projected Changes in Visual Air Quality

a. Applicable Class I Areas

This projection of visibility improvement covers the 16 Class I areas of the Colorado Plateau, as defined in 40 CFR 51.309(b)(1).

b. Projected Visibility Improvement

Pursuant to 40 CFR 51. 309(d)(2), Tables 22 and 23 on the following pages indicate the projected visibility improvement in deciviews for each of the 16 Class I areas, from the baseline year of 1996 through December 31, 2018. These projections were made for the 20% worst days and 20% best days, and is expressed in deciview (dV). The first column represents the best estimate of actual visibility condition in 1996. The second column represents the expected conditions in 2018 without the implementation of the 309 strategies and programs. These results are from the technical work conducted by the WRAP, which evaluated the visibility improvements resulting from the application of the regional haze control strategies and programs described in Chapter 2 of the WRAP TSD. Chapter 2 and Appendix A of the WRAP TSD describe the control strategies and programs modeled for improvement of visibility by 2018.

Table 22. Projected Visibility Improvement at the 16 Colorado Plateau Class I Areas in 2018, on the Average 20% Best Visibility Days, Resulting from Implementation of "All §309 Control Strategies"

		Modeling Results		
Colorado Plateau Class I Area	State	**1996 - 20% Best Days' Visibility (dV) (Base Case)**	**2018 - 20% Best Days' Visibility (dV) (Base Case - all controls "on the books" as of 2002)**	**2018 - 20% Best Days' Visibility (dV) (All §309 Control Strategies)**
Grand Canyon National Park	AZ	4.80	4.76	4.64
Mount Baldy Wilderness	AZ	5.50	5.49	5.36
Petrified Forest National Park	AZ	6.50	5.18	5.10
Sycamore Canyon Wilderness	AZ	6.30	4.85	4.75
Black Canyon of the Gunnnison NP Wilderness	CO	4.60	3.89	3.75
Flat Tops Wilderness	CO	3.10	3.96	3.81
Maroon Bells Wilderness	CO	3.10	3.90	3.80
Mesa Verde National Park	CO	5.50	4.40	4.33
Weminuche Wilderness	CO	3.10	3.89	3.74
West Elk Wilderness	CO	4.60	3.97	3.82
San Pedro Parks Wilderness	NM	4.00	5.59	5.36

Arches National Park	UT	5.50	4.85	4.61
Bryce Canyon National Park	UT	4.30	3.91	3.89
Canyonlands National Park	UT	5.60	4.87	4.67
Capital Reef National Park	UT	5.60	4.85	4.75
Zion National Park	UT	5.90	3.81	3.75

Most of the 16 Class I areas are expected to show improvements 1996 - 2018 for the average of the 20% best days, and that progress goes beyond the national visibility goal in the Clean Air Act, which only requires preserving existing visibility conditions on the cleanest days. Only Petrified Forest, Sycamore Canyon, and Zion expect improvements that are greater than 1dV and thus likely to be perceptible. Also, these small improvements may be within the "noise" of the model. All of the areas show improvements due to 309 control strategies, as compared to a future without these strategies.

Table 23. Projected Visibility Improvement at the 16 Colorado Plateau Class I Areas in 2018 on the Average 20% Worst Days, Resulting from Implementation of "All §309 Control Strategies"

		Modeling Results		
Colorado Plateau Class I Area	State	**1996 – 20% Worst Days' Visibility (dV) (Base Case)**	**2018 – 20% Worst Days' Visibility (dV) (Base Case – all controls "on the books" as of 2002)**	**2018 – 20% Worst Days' Visibility (dV) (All §309 Control Strategies)**
Grand Canyon National Park	AZ	12.30	11.62	11.51
Mount Baldy Wilderness	AZ	14.30	12.22	11.96
Petrified Forest National Park	AZ	13.00	11.99	11.74
Sycamore Canyon Wilderness	AZ	15.40	11.63	11.48
Black Canyon of the Gunnison NP Wilderness	CO	11.30	10.90	10.60
Flat Tops Wilderness	CO	10.50	11.04	10.73
Maroon Bells Wilderness	CO	10.60	11.15	10.84
Mesa Verde National Park	CO	13.10	12.24	11.84
Weminuche Wilderness	CO	10.60	11.19	10.84
West Elk Wilderness	CO	11.30	11.08	10.72
San Pedro Parks Wilderness	NM	10.70	12.33	11.71
Arches National Park	UT	12.10	12.41	12.15
Bryce Canyon National Park	UT	11.80	12.26	11.95
Canyonlands National Park	UT	12.10	12.41	12.18
Capital Reef National Park	UT	12.10	12.51	12.36
Zion National Park	UT	13.60	12.13	12.03

Many of the 16 Class I areas do not show improvements 1996 - 2018 for the average of the 20% worst days. In most cases, however, the expected deterioration is less than 1dV and thus likely to be imperceptible. Also, these small changes may be within the "noise" of the model.

L. PERIODIC IMPLEMENTATION PLAN REVISIONS

1. Periodic Progress Reports for Demonstrating Reasonable Progress.

Pursuant to 40 CFR 51.309(d)(10)(i), the State of Utah shall submit to EPA, as a SIP revision, periodic progress reports for the years 2008, 2013, and 2018 for the purpose of demonstrating reasonable progress in Class I areas within Utah, and Class I areas outside Utah that are affected by emissions from Utah. This demonstration may be conducted by the WRAP, with assistance from Utah, and shall address the elements listed under 40 CFR 51.309(d)(10)(i)(A) through (G), as summarized below:

1. Implementation status of 2003 SIP measures;
2. Summary of emissions reductions;
3. Assessment of most/least impaired days;
4. Analysis of emission reductions by pollutant;
5. Significant changes in anthropogenic emissions;
6. Assessment of 2003 SIP sufficiency; and
7. Assessment of visibility monitoring strategy.

2. Actions To Be Taken Concurrent with Periodic Progress Reports.

Pursuant to 40 CFR 51.309(d)(10)(ii), the State of Utah shall take one of the following actions based upon information contained in each periodic progress report:

(1) Provide a negative declaration statement to EPA saying that no implementation plan revision is needed if reasonable progress is being made, in accordance with section *(a)* above;

(2) If the state finds that the implementation plan is inadequate to ensure reasonable progress due to emissions from outside the state, Utah shall notify EPA and the other contributing state(s), and initiate efforts through a regional planning process to address the emissions in question. The State of Utah shall identify in the next progress report the outcome of this regional planning effort, including any additional strategies that were developed to address the plan's deficiencies;

(3) If the state finds that the implementation plan is inadequate to ensure reasonable progress due to emissions from another country, Utah shall notify EPA and provide information on the impairment being caused by these emissions; or

(4) If the state finds that the implementation plan is inadequate to ensure reasonable progress due to emissions from within Utah, Utah shall develop additional strategies to address the plan deficiencies and revise the implementation plan no later than one year from the date that the progress report was due.

M. STATE PLANNING/INTERSTATE COORDINATION AND TRIBAL IMPLEMENTATION

a. Participation in Regional Planning and Coordination

Pursuant to 40 CFR 51.309(d)(11), the State of Utah has participated in regional planning and coordination with other states in developing its emission reduction strategies under 40 CFR 51.309, related to protecting the 16 Class I areas of the Colorado Plateau. This participation was through the WRAP.

b. Applicability to Tribal Lands

Pursuant to 40 CFR 51.309(d)(12), and in accordance with the Tribal Authority Rule, the Tribe whose lands are surrounded by the State of Utah have the option to develop a regional haze TIP for their lands to assure reasonable progress in the 16 Class I areas of the Colorado Plateau. As such, no provisions of this chapter of the implementation plan shall be construed as being applicable to tribal lands.

Utah State Implementation Plan

Section XX

Regional Haze

APPENDICES

Addressing Regional Haze Visibility Protection for the Mandatory Federal Class I Areas Required Under 40 CFR 51.309

Revised –August 15, 2003

Complete Document Available On-line at
http://www.airquality.utah.gov/SIP/Regionalhazesip/regionalhaze.htm

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EXPLANATORY NOTE

The Appendix numbering is based on the Part number of the Section XX Regional Haze SIP Revision. Thus, Appendix B is referenced in Part B of the Section XX Regional Haze SIP. The reader is directed to that chapter for more information about the subject discussed in the Appendix.

A. (Reserved).

B. Definitions

1. Applicable Definitions from 40 CFR 51.301, in effect on July 1, 2003

BART-eligible source means an existing stationary facility as defined in this section.

Best Available Retrofit Technology (BART) means an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant, which is emitted by an existing stationary facility. The emission limitation must be established, on a case-by-case basis, taking into consideration the technology available, the costs of compliance, the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use or in existence at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.

Deciview means a measurement of visibility impairment. A deciview is a haze index derived from calculated light extinction, such that uniform changes in haziness correspond to uniform incremental changes in perception across the entire range of conditions, from pristine to highly impaired. The deciview haze index is calculated based on the following equation (for the purposes of calculating deciview, the atmospheric light extinction coefficient must be calculated from aerosol measurements):

Deciview haze index = 10 $1n_e$ ($b_{ext}/10\ Mm^{-1}$).
Where b_{ext} = the atmospheric light extinction coefficient, expressed in inverse megameters (Mm^{-1}).

Existing stationary facility means any of the following stationary sources of air pollutants, including any reconstructed source, which was not in operation prior to August 7, 1962, and was in existence on August 7, 1977, and has the potential to emit 250 tons per year or more of any air pollutant. In determining potential to emit, fugitive emissions, to the extent quantifiable, must be counted.

Fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour heat input,
Coal cleaning plants (thermal dryers),
Kraft pulp mills,
Portland cement plants,
Primary zinc smelters,
Iron and steel mill plants,
Primary aluminum ore reduction plants,
Primary copper smelters,
Municipal incinerators capable of charging more than 250 tons of refuse per day,
Hydrofluoric, sulfuric, and nitric acid plants,
Petroleum refineries,
Lime plants,
Phosphate rock processing plants,

Coke oven batteries,
Sulfur recovery plants,
Carbon black plants (furnace process),
Primary lead smelters,
Fuel conversion plants,
Sintering plants,
Secondary metal production facilities,
Chemical process plants,
Fossil-fuel boilers of more than 250 million British thermal units per hour heat input,
Petroleum storage and transfer facilities with a capacity exceeding 300,000 barrels,
Taconite ore processing facilities,
Glass fiber processing plants, and
Charcoal production facilities.

Federal Class I area means any Federal land that is classified or reclassified Class I.

Federal Land Manager means the Secretary of the department with authority over the Federal Class I area (or the Secretary's designee) or, with respect to Roosevelt-Campobello International Park, the Chairman of the Roosevelt-Campobello International Park Commission.

Federally enforceable means all limitations and conditions which are enforceable by the Administrator under the Clean Air Act including those requirements developed pursuant to parts 60 and 61 of this title, requirements within any applicable State Implementation Plan, and any permit requirements established pursuant to Sec. 52.21 of this chapter or under regulations approved pursuant to part 51, 52, or 60 of this title.

Implementation plan means, for the purposes of this part, any State Implementation Plan, Federal Implementation Plan, or Tribal Implementation Plan.

Indian tribe or tribe means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village, which is federally recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

In existence means that the owner or operator has obtained all necessary preconstruction approvals or permits required by Federal, State, or local air pollution emissions and air quality laws or regulations and either has (1) begun, or caused to begin, a continuous program of physical on-site construction of the facility or (2) entered into binding agreements or contractual obligations, which cannot be cancelled or modified without substantial loss to the owner or operator, to undertake a program of construction of the facility to be completed in a reasonable time.

Least impaired days means the average visibility impairment (measured in deciviews) for the twenty percent of monitored days in a calendar year with the lowest amount of visibility impairment.

Major stationary source and major modification mean major stationary source and major modification, respectively, as defined in Sec. 51.166.

Mandatory Class I Federal Area means any area identified in part 81, subpart D of this title.

Most impaired days means the average visibility impairment (measured in deciviews) for the twenty percent of monitored days in a calendar year with the highest amount of visibility impairment.

Natural conditions includes naturally occurring phenomena that reduce visibility as measured in terms of light extinction, visual range, contrast, or coloration.

Potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source.

Reasonably attributable means attributable by visual observation or any other technique the State deems appropriate.

Reasonably attributable visibility impairment means visibility impairment that is caused by the emission of air pollutants from one, or a small number of sources.

Regional haze means visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources.

State means ``State'' as defined in section 302(d) of the CAA.

Stationary Source means any building, structure, facility, or installation, which emits or may emit any air pollutant.

Visibility impairment means any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under natural conditions.

2. Applicable Definitions from 40 CFR 51.309, in effect on July 1, 2003

16 Class I areas means the following mandatory Class I Federal areas on the Colorado Plateau: Grand Canyon National Park, Sycamore Canyon Wilderness, Petrified Forest National Park, Mount Baldy Wilderness, San Pedro Parks Wilderness, Mesa Verde National Park, Weminuche Wilderness, Black Canyon of the Gunnison Wilderness, West Elk Wilderness, Maroon Bells Wilderness, Flat Tops Wilderness, Arches National Park, Canyonlands National Park, Capital Reef National Park, Bryce Canyon National Park, and Zion National Park.

Transport Region State means one of the States that is included within the Transport Region addressed by the Grand Canyon Visibility Transport Commission (Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming).

Commission Report means the report of the Grand Canyon Visibility Transport Commission entitled ``Recommendations for Improving Western Vistas,'' dated June 10, 1996.

Fire means wildfire, wildland fire (including prescribed natural fire), prescribed fire, and

agricultural burning conducted and occurring on Federal, State, and private wildlands and farmlands.

Milestone means the maximum level of annual regional sulfur dioxide emissions for a given year, assessed annually consistent with paragraph (h)(2) of this section beginning in the year 2003.

Mobile Source Emission Budget means the lowest level of VOC, NOx, SO_2, elemental and organic carbon, and fine particles which are projected to occur in any area within the transport region from which mobile source emissions are determined to contribute significantly to visibility impairment in any of the 16 Class I areas.

Geographic enhancement means a method, procedure, or process to allow a broad regional strategy, such as a milestone or backstop market trading program designed to achieve greater reasonable progress than BART for regional haze, to accommodate BART for reasonably attributable impairment.

BHP San Manuel means: (i) The copper smelter located in San Manuel, Arizona which operated during 1990, but whose operations were suspended during the year 2000, (ii) The same smelter in the event of a change of name or ownership.

Phelps Dodge Hidalgo means: (i) The copper smelter located in Hidalgo, New Mexico which operated during 1990, but whose operations were suspended during the year 2000, (ii) The same smelter in the event of a change of name or ownership.

3. Definitions for the Fire Programs

Agricultural Fuel or Agricultural Burning means any fire ignited by management actions to meet specific objectives (i.e., managed to achieve resource benefits) on agricultural land.

Alternatives to Fire means non-burning techniques that replace fire and that are used to achieve a particular land management objective, including but not limited to reduction of fuel loading, manipulation of fuels, enhancement of wildlife habitat, and ecosystem restructuring.

Emission Reduction Techniques means techniques for controlling emissions from prescribed fires to minimize the amount of emission output per unit or acre burned.

Fire means wildfire, wildland fire(including prescribed natural fire), prescribed fire, and agricultural burning conducted and occurring on federal, state and private wildlands and farmlands.

Land Manager means any federal, state, local, or private entity that owns, administers, directs, oversees or controls the use of public or private land, including the application of fire to the land.

Prescribed fire or ***prescribed burn*** means any fire ignited by management actions to meet specific objectives, such as achieving resource benefits.

Wildfire means any unwanted, non-structural fire.

Wildland means an area in which development is essentially non-existent, except for pipelines, power lines, roads, railroads, or other transportation or conveyance facilities.

Wildland Fire means all types of fire occurring in the wildland, except for fire on agricultural land.

Wildland Fire Used for Resource Benefits means naturally ignited wildland fire that is managed to accomplish specific prestated resource management objectives in predefined geographic areas.

4. Definitions for the Western Emission Backstop Trading Program

Account Certificate of Representation means the completed and signed submission required to designate an Account Representative for a WEB source or an Account Representative for a general account.

Account Representative means the individual who is authorized through an Account Certificate of Representation to represent owners and operators of the WEB source with regard to matters under the WEB Trading Program or, for a general account, who is authorized through an Account Certificate of Representation to represent the persons having an ownership interest in allowances in the general account with regard to matters concerning the general account.

Act means the Clean Air Act, as amended, 42 U.S.C. 7401, *et seq.*

Actual Emissions means total annual SO_2 emissions as reported to the executive secretary in accordance with the requirements R307-250-9 or R307-150, as applicable.

Allocate means to assign allowances to a WEB source in accordance with sections XX.E.3.a. through XX.E.3.e of this plan.

Allowance means the limited authorization under the WEB Trading Program to emit one ton of SO_2 during a specified control period or any control period thereafter subject to the terms and conditions for use of unused allowances as established by R307-250.

Allowance limitation means the tonnage of SO_2 emissions authorized by the allowances available for compliance deduction for a WEB source for a control period under R307-250-12(1) on the allowance transfer deadline for that control period.

Allowance Tracking System means the system where allowances under the WEB Trading Program are recorded, held, transferred and deducted.

Allowance Tracking System account means an account in the Allowance Tracking System established for purposes of recording, holding, transferring, and deducting allowances.

Compliance account means an account established in the Allowance Tracking System under R307-250-8(1) for the purpose of recording allowances that a WEB source might hold to demonstrate compliance with its allowance limitation.

Control period means the period beginning January 1 of each year and ending on December 31 of the same year, inclusive.

Emissions tracking database means the central database where SO_2 emissions for WEB sources as recorded and reported in accordance with R307-250 are tracked to determine compliance with

allowance limitations.

Emission Unit means any part of a stationary source, which emits or has the potential to emit any pollutant subject to regulation under the Clean Air Act.

EPA Administrator means the Administrator of the United States Environmental Protection Agency or the Administrator's duly authorized representative.

Existing source means a stationary source that commenced operation before the Program Trigger Date.

Floor allocation means the amount of allowances set by the executive secretary in accordance with this Plan that represents the minimum necessary for a source to operate under stringent control assumptions.

General account means an account established in the Allowance Tracking System under R307-250-8 for the purpose of recording allowances held by a person that are not to be used to show compliance with an allowance limitation.

Milestone means the maximum level of stationary source regional sulfur dioxide emissions for each year from 2003 to 2018, established according to the procedures in section XX.E.1 of this plan.

New WEB Source means a WEB source that commenced operation on or after the Program Trigger Date.

New Source Set-aside means a pool of allowances that are available for allocation to new WEB sources and modified WEB sources that have increased capacity in accordance with the provisions of Section E.3.c of this plan.

Opt-in means to choose to participate in the WEB Trading Program by following the procedures in R307-250-4(4) and to comply with the terms and conditions of the R307-250.

Program Trigger Date means the date that the executive secretary determines that the WEB Trading Program has been triggered in accordance with the provisions of section XX.E.1.b of this plan.

Reducible allocation means the amount of allowances set by the executive secretary in accordance with section XX.E.3.a(2)(i) of this plan that represents, for each source, emissions in excess of the floor allocation that shall be reduced over time as the regional milestone is decreased.

Renewable Energy Facility means a facility that generates electricity by non-nuclear and non-fossil technologies that results in low or no air emissions. The term includes electricity generated by wind energy technologies; solar photovoltaic and solar thermal technologies; geothermal technologies; technologies based on landfill gas and biomass sources, and new low-impact hydropower that meets the Low-Impact Hydropower Institute criteria. Biomass includes agricultural, food and wood wastes. For the purposes of this Plan, a renewable energy facility does not include pumped storage or biomass from municipal solid waste, black liquor, or treated wood.

Retired source means a WEB source that has received a retired source exemption as provided in R307-250-4(5).

Stationary source means any building, structure, facility or installation that emits or may emit any air pollutant subject to regulation under the Clean Air Act.

Ton means 2000 pounds and, for any control period, any fraction of a ton equaling 1000 pounds or more shall be treated as one ton and any fraction of a ton equaling less than 1000 pounds shall be treated as zero tons.

Tracking System Administrator means the person designated by the executive secretary as the administrator of the WEB Allowance Tracking System and the emission tracking database.

Tribal Set-Aside means a 20,000-ton SO_2 WEB allowance allocated to tribes on an annual basis. The tribes will decide how to distribute the allowances in the set-aside among tribes in the region. The set-side is intended to ensure equitable treatment for tribal economies and to prevent barriers to economic development.

Trigger refers to the activation of the WEB Trading Program for SO_2 in accordance with section XX.E.1 of this plan.

WEB source means a stationary source that meets the applicability requirements of R307-250-4

WEB Trading Program refers to the Western Backstop (WEB) Trading Program Rule, R307-250, that shall be triggered as a backstop in accordance the provisions in section XX.E.1 of this plan to ensure that regional SO_2 emissions are reduced.

Western Regional Air Partnership (WRAP) means the collaborative effort of tribal governments, state governments, and federal agencies to promote and monitor implementation of recommendations from the Grand Canyon Visibility Transport Commission authorized under Section 169B(f) of the Clean Air Act, and to address other common Western regional air quality issues.

C. Clean Air Corridors – WRAP Policy

The following is the executive summary of the WRAP Policy related to Clean Air Corridors.[3]

Summary of WRAP Policy

Pursuant to 40 CFR 51.309(d)(3), the State of Utah will ensure that the Technical Oversight Committee (TOC) will track emissions and describe the tracking process in such a way that can be included in state and tribal implementation plans. At a minimum, using the most recent state emission inventories available, the TOC should produce a report for each five-year implementation plan revision on the current and projected emissions in the clean air corridor and in areas outside the corridor and compare these emissions to a 1996 baseline for purposes of this section.

Pursuant to 40 CFR 51.309(d)(3)(i), the WRAP identifies one clean air corridor as shown in Figure 1 of the WRAP Policy on Clean Air Corridors which is included in the Utah Supplement to the WRAP TSD. The counties within the corridor are listed in Table 1 of the same document. For ease of administration, the corridor's boundary follows county lines.

Pursuant to 40 CFR 51.309(d)(3)(ii), the WRAP has examined patterns of growth in the corridor and finds that they are not causing significant emission increases that could have or are having visibility impacts at one or more of the 16 Class I areas. Nor, at this time, are such emission increases expected during the first planning period (2003-2018). Analyses performed by the Grand Canyon Visibility Transport Commission found that an increase of 25% in weighted emissions would result in a 0.7dv reduction in visibility, whereas the weighted emission increase expected by 2018 is only 4%.

Pursuant to 40 CFR 51.309(d)(3)(iii), the WRAP has examined emissions growth in areas outside the corridor and finds that significant emissions growth is not occurring that could begin or is beginning to impair the quality of the air in the corridor and thereby lead to visibility degradation for the least impaired days in one or more of the 16 Class I areas.

Since impairment of air quality in clean air corridors has not been identified pursuant to 40 CFR 51.309(d)(3)(ii) and (iii), the WRAP finds no requirement under 40 CFR 51.309(d)(3)(iv) for further visibility impact analysis or additional emission reduction measures until at least the next SIP revision (2008). However, the WRAP encourages its appropriate technical activities – such as the Causes of Haze report – to take into account the assessment and protection of clean air corridors.

Pursuant to 40 CFR 51.309(d)(3)(v), the WRAP finds no other clean air corridors beyond the corridor identified in Figure 1.

Conclusion

While the area to the northwest of the Colorado Plateau delivers clean air to the Plateau on the

[3] Western Regional Air Partnership. *WRAP Policy on Clean Air Corridors.* November, 2002.

cleanest days, emissions from throughout much of the region affect the Class I areas on the Plateau. Thus, emissions throughout the WRAP region will be tracked carefully. Ongoing WRAP efforts to improve the quality of inventories and the models used to make projections, and to produce a periodic Causes of Haze report, will bring increased understanding of the role that clean air corridors play in protecting the cleanest days. In the final analysis, the indicator of success or failure will be whether the measured light extinction at the Class I areas on the Colorado Plateau improves or declines on the cleanest days. Any indication of deterioration on the cleanest days should trigger an immediate investigation of the cause, as well as efforts to correct the problem.

D. Memorandum of Agreement

between

[Federal Land Management Agency]

and

[State]

1. Introduction

The Clean Air Act requires States to address visibility impairment in mandatory Federal Class I areas. Major stationary sources which meet certain size, type, and age requirements and which are reasonably anticipated to cause or contribute to visibility impairment must install Best Available Retrofit Technology (BART). In 1980 EPA promulgated regulations to implement this requirement for these sources that are near the mandatory Class I Federal areas. To address such sources under the 1980 regulations, a State or a Federal Land Manager must certify that visibility impairment exists and indicate whether any of the "BART" eligible sources are reasonably anticipated to cause or contribute to the impairment. The State would then determine if all or part of the impairment is "reasonably attributed" to a BART eligible source. If such a determination is made, the State is required to conduct an analysis to determine the BART level of control for that source. Only States which contain mandatory Federal Class I areas have these provisions. In 1999, EPA promulgated regulations for all States to require BART for all sources based on those sources' contribution to regional haze visibility impairment. EPA also provides for this BART requirement for regional haze impacts to be met though establishment of alternative control measures, including a market-based trading program, under which all BART sources would participate. These alternative measures may include other stationary sources as well. If a state adopts an alternative measure, the BART requirement is addressed when that measure is fully implemented.

On [DATE], [STATE] adopted an implementation plan to address the BART requirement for major stationary sources of sulfur dioxide through a multi-state regional cap and back-stop market trading program. Under this implementation plan the BART emissions reduction requirement is not fully implemented until the regional plan matures in 2018. Between the date of signature of this memorandum of agreement and 2018, the [State] and [Federal Land Management Agency] agree to the following criteria for certification of visibility impairment under the 1980 visibility protection rules incorporated in the state implementation plan at [cite state rules or EPA FIP].

(1) Criteria for Federal Land Manager Certification and State Specific Source BART Review. The [Federal Land Management Agency] will not certify "reasonably attributable" impairment at mandatory federal Class I areas affected by emissions of sulfur dioxide from sources contained within [STATE] unless:

- The [Federal Land Management Agency] determines that sulfate concentrations are not decreasing since the year 2000, based on ambient monitoring, and

- There are BART-eligible sources of sulfur dioxide within 150 kilometers of the mandatory Federal Class I area, and

- The BART-eligible sources have not installed control technology to reduce sulfur dioxide emissions at a rate equivalent to capture of 85% of potential annual emissions.ven if the above criteria are met, the [Federal Land Management Agency] may choose not to certify. In addition to the criteria, the State and the FLM agree to provide information related to visibility impairment associated with regional emissions of sulfur dioxide, in a public forum, in sufficient time to allow private interests to plan future sulfur dioxide emissions reductions under the multi-state regional cap and backstop market trading program in a manner which addresses reasonably attributable BART requirements, such as when the criteria are not being met or are likely to not be met by 2018, and conditions where new visibility related monitoring or modeling uncovers unique source-receptor relationships. (See **Other Considerations** below)

(2) Timing of Certification.

The [Federal Land Management Agency] will review ambient air quality data and other technical information, including air quality modeling, to determine the need for addressing reasonable progress through a certification before 2013. The [Federal Land Management Agency] recognizes that the owners and operators of BART eligible sources covered by the sulfur dioxide regional cap and back-stop trading program will need to commit to controls or be financially prepared to purchase allocations for emissions in the last five years of the trading program in order for the region to meet its goal. In this regard, such sources would benefit by knowing whether the regional program, by the year 2013, has afforded protection to all of the class I areas by contributing to reductions in sulfate concentrations. Information on visibility impairment at Class I areas and the relationship of trends in particulate sulfate concentrations will be shared by the [Federal Land Management Agency] with the State and interested parties as soon as available. The FLM commits to bring all available relevant information to the State's public meeting related to planning of future sulfur dioxide emissions reductions and related BART concerns. This sharing of information is intended to promote the resolution of all likely certification cases under the cap and backstop market operation.

2. **Other Considerations**

The [Federal Land Management Agency] also commits to discussions with [State] and the owner-operators of BART eligible sources which may be affected by a certification under the criteria noted above, for the purposes of discussing: 1) the future plans for controlling sulfur dioxide emissions from the source, 2) the expectations of the State in how sulfate concentrations will be affected by future reductions of regional emissions under the cap and market-backstop program, and 3) whether the sulfate concentrations seen at the Class I area in question are affected by sources outside of the cap region or changes in sulfur dioxide emissions from beyond the United States. The [Federal Land Management Agency] agrees to take these factors into consideration before certifying impairment it believes is reasonably attributable to a specific BART eligible source.

For the [Federal Land Management Agency]

_____
Title:
Date _____

For the [State]

_____
Title:
Date _____

E. WEB MODEL RULE MONITORING PROTOCOLS

Protocol WEB-1: SO_2 Monitoring of Fuel Gas Combustion Devices

1. Applicability

(a) The provisions of this protocol are applicable to fuel gas combustion devices at petroleum refineries.

(b) Fuel gas combustion devices include boilers, process heaters, and flares used to burn fuel gas generated at a petroleum refinery.

(c) Fuel gas means any gas which is generated and combusted at a petroleum refinery. Fuel gas does not include(1) natural gas, unless combined with other gases generated at a petroleum refinery, (2) gases generated by a catalytic cracking unit catalyst regenerator, (3) gases generated by fluid coking burners, (4) gases combusted to produce sulfur or sulfuric acid, or (5) process upset gases generated due to startup, shutdown, or malfunctions.

2. Monitoring Requirements

(a) Except as provided in paragraphs (b) and (c) of this Section 2, fuel gas combustion devices shall use a continuous fuel gas monitoring system (CFGMS) to determine the total sulfur content (reported as H_2S) of the fuel gas mixture prior to combustion, and continuous fuel flow meters to determine the amount of fuel gas burned.

(1) Fuel gas combustion devices having a common source of fuel gas may be monitored for sulfur content at one location, if monitoring at that location is representative of the sulfur content of the fuel gas being burned in any fuel gas combustion device.

(2) The CFGMS shall meet the performance requirements in Performance Specification 2 in Appendix B to 40 CFR Part 60, and the following:

(i) Continuously monitor and record the concentration by volume of total sulfur compounds in the gaseous fuel reported as ppmv H_2S.

(ii) Have the span value set so that the majority of readings fall between 10 and 95% of the range.

(iii) Record negative values of zero drift.

(iv) Calibration drift shall be ≤ 5.0% of the span, for initial certification and daily calibration error tests.

(v) Methods 15A, 16, or approved alternatives for total sulfur, are the reference methods for the relative accuracy test. The relative

accuracy test shall include a bias test in accordance with paragraph 4.(c) of this section.

(3) All continuous fuel flow meters shall comply with the provisions of section 2.1.5 of Appendix D to 40 CFR Part 75.

(4) The hourly mass SO_2 emissions rate for all the fuel gas combustion devices monitored by this approach shall be calculated using the following equation:

$$E_t = (C_S)(Q_t)(K)$$

where: E_t = Total SO_2 emissions in lb/hr from applicable fuel gas combustion devices
C_S = Sulfur content of the fuel gas as H_2S(ppmv)
Q_t = Fuel gas flow rate to the applicable fuel gas combustion devices (scf/hr)
$K = 1.660 \times 10^{-7}$ (lb/scf)/ppmv

(b) In place of a CFGMS in paragraph (a) of this Section 2, fuel gas combustion devices having a common source of fuel gas may be monitored with an SO_2 CEMS, a flow CEMS, and (if necessary) a moisture monitoring system at only one location, if the CEMS monitoring at that location is representative of the SO_2 emission rate (lb SO_2/scf fuel gas burned) of all applicable fuel gas combustion devices. Continuous fuel flow meters shall be used in accordance with paragraph (a), and the fuel gas combustion device monitored by a CEMS shall have separate fuel metering.

(1) Each CEMS for SO_2, flow, and (if applicable) moisture, shall comply with the operating requirements, performance specifications, and quality assurance requirements of 40 CFR Part 75.

(2) All continuous fuel flow meters shall comply with the provisions of section 2.1.5 of Appendix D to 40 CFR Part 75.

(3) The SO_2 hourly mass emissions rate for all the fuel gas combustion devices monitored by this approach shall be determined by the ratio of the amount of fuel gas burned by the CEMS-monitored fuel gas combustion device to the total fuel gas burned by all applicable fuel gas combustion devices using the following equation:

$$E_t = (E_m)(Q_t)/(Q_m)$$

where: E_t = Total SO_2 emissions in lb/hr from applicable fuel gas combustion devices
E_m = SO_2 emissions in lb/hr from the CEMS-monitored fuel gas combustion device, calculated using Equation F-1 or (if applicable) F-2 in Appendix F to 40 CFR Part 75
Q_t = Fuel gas flow rate (scf/hr) to the applicable fuel gas combustion devices
Q_m = Fuel gas flow rate (scf/hr) to the CEMS-monitored fuel gas combustion device

(c) In place of a CFGMS in paragraph (a) of this section, fuel gas combustion devices having a common source of fuel gas may be monitored with an SO_2 - diluent CEMS at only one location, if the CEMS monitoring at that location is representative of the SO_2 emission rate (lb SO_2/mmBtu) of all applicable fuel gas combustion devices. If this option is selected, the owner or operator shall conduct fuel gas sampling and analysis for gross calorific value (GCV), and shall use continuous fuel flow metering in accordance with paragraph (a) of this Section 2, with separate fuel metering for the CEMS-monitored fuel gas combustion device.

(1) Each SO_2-diluent CEMS shall comply with the applicable provisions for SO_2 monitors and diluent monitors in 40 CFR Part 75, and shall use the procedures in section 3 of Appendix F to Part 75 for determining SO_2 emission rate (lb/mmBtu) by substituting the term SO_2 for NO_x in that section, and using a K factor of 1.660×10^{-7} (lb/scf)/ppmv instead of the NO_x K factor.

(2) All continuous fuel flow meters and fuel gas sampling and analysis for GCV to determine the heat input rate from the fuel gas shall comply with the applicable provisions in sections 2.1.5 and 2.3.4 of Appendix D to 40 CFR Part 75.

(3) The SO_2 hourly mass emissions rate for all the fuel gas combustion devices monitored by this approach shall be calculated by using the following equation:

$$E_t = (E_m)\ (Q_t)(GCV)/10^6$$

where:

E_t = Total hourly SO_2 mass emissions in lb/hr from the applicable fuel gas combustion devices
E_m = SO_2 emission rate in lb/mmBtu from the CEMS - monitored fuel gas combustion device Q_t = Fuel gas flow rate (scf/hr) to the applicable fuel gas combustion devices
GCV = Fuel Gross Calorific Value (Btu/scf)
10^6 = Conversion from Btu to million Btu

(d) Calculate total SO_2 mass emissions for each calendar quarter and each calendar year based on the emissions in lb/hr and Equations F-3 and F-4 in Appendix F to 40 CFR Part 75, Appendix F.

3. Certification/Recertification Requirements

All monitoring systems are subject to initial certification and recertification testing as follows:

(a) The owner or operator shall comply with the initial testing and calibration requirements in Performance Specification 2 in Appendix B to 40 CFR Part 60 and paragraph 2 (a)(2) of this section for each CFGMS.

(b) Each CEMS for SO_2 and flow or each SO_2-diluent CEMS shall comply with the testing and calibration requirements specified in 40 CFR Part 75, section 75.20 and Appendices A and B, except that each SO_2-diluent CEMS shall meet the relative accuracy requirements for a NO_x-diluent CEMS (lb/mmBtu).

(c) A continuous fuel flow meter shall comply with the certification and quality-assurance requirements in sections 2.1.5 and 2.1.6 to Appendix D to 40 CFR Part 75.

4. Quality Assurance/Quality Control Requirements

(a) A quality assurance/quality control (QA/QC) plan shall be developed and implemented for each CEMS for SO_2 and flow or the SO_2-diluent CEMS in compliance with sections 1, 1.1, and 1.2 of Appendix B to Part 75.

(b) A QA/QC plan shall be developed and implemented for each continuous fuel flow meter and fuel sampling and analysis in compliance with sections 1, 1.1, and 1.3 of Appendix B to 40 CFR Part 75.

(c) A QA/QC plan shall be developed and implemented for each CFGMS in compliance with sections 1 and 1.1 of Appendix B to 40 CFR Part 75, and the following:

(i) Perform a daily calibration error test of each CFGMS at two gas concentrations, one low level and one high level. Calculate the calibration error as described in Appendix A to 40 CFR Part 75. An out of control period occurs whenever the error is greater than 5.0% of the span value.

(ii) In addition to the daily calibration error test, an additional calibration error test shall be performed whenever a daily calibration error test is failed, whenever a monitoring system is returned to service following repairs or corrective actions that may affect the monitor measurements, or after making manual calibration adjustments.

(iii) Perform a linearity test once every operating quarter. Calculate the linearity as described in Appendix A to 40 CFR Part 75. An out of control period occurs whenever the linearity error is greater than 5.0 percent of a reference value, and the absolute value of the difference between average monitor response values and a reference value is greater than 5.0 ppm.

(iv) Perform a relative accuracy test audit once every four operating quarters. Calculate the relative accuracy as described in Appendix A to 40 CFR Part 75. An out of control period occurs whenever the relative accuracy is greater than 20.0% of the mean value of the reference method measurements.

(v) Using the results of the relative accuracy test audit, conduct a bias test in accordance with Appendix A to 40 CFR Part 75, and calculate and apply a bias adjustment factor if required.

5. Missing Data Procedures

(a) For any period in which valid data are not being recorded by an SO_2 CEMS or flow CEMS specified in this section, missing or invalid data shall be replaced with substitute data in accordance with the requirements in Subpart D of 40 CFR Part 75.

(b) For any period in which valid data are not being recorded by an SO_2-diluent CEMS specified in this section, missing or invalid data shall be replaced with substitute data on a rate basis (lb/mmBtu) in accordance with the requirements for SO_2 monitors in Subpart D of 40 CFR Part 75.

(c) For any period in which valid data are not being recorded by a continuous fuel flow meter or for fuel gas GCV sampling and analysis specified in this section, missing or invalid data shall be replaced with substitute data in accordance with missing data requirements in Appendix D to 40 CFR Part 75.

(d) For any period in which valid data are not being recorded by the CFGMS specified in this section, hourly missing or invalid data shall be replaced with substitute data in accordance with the missing data requirements for units performing hourly gaseous fuel sulfur sampling in section 2.4 of Appendix D to 40 CFR Part 75.

6. Monitoring Plan and Reporting Requirements

In addition to the general monitoring plan and reporting requirements of Section I of this Rule, the owner or operator shall meet the following additional requirements:

(a) The monitoring plan shall identify each group of units that are monitored by a single monitoring system under this Protocol WEB-1, and the plan shall designate an identifier for the group of units for emissions reporting purposes. For purpose of submitting emissions reports, no apportionment of emissions to the individual units within the group is required.

(b) If the provisions of paragraphs 2.(b) or (c) are used, provide documentation and an explanation to demonstrate that the SO_2 emission rate from the monitored unit is representative of the rate from non-monitored units.

Protocol WEB-2: Predictive Flow Monitoring Systems for Kilns with Positive Pressure Fabric Filter

1. Applicability

The provisions of this protocol are applicable to cement kilns or lime kilns that (1) are controlled by a positive pressure fabric filter, (2) combust only a single fuel, no fuel blends, and (3) have operating conditions upstream of the fabric filter that the WEB source documents would reasonably prevent reliable flow monitor measurements. This protocol does not modify the SO_2 monitoring requirements in section I of this Rule.

2. Monitoring Requirements

(a) A cement or lime kiln with a positive pressure fabric filter shall use a predictive flow monitoring system (PFMS) to determine the hourly kiln exhaust gas flow.

(b) A PFMS is the total equipment necessary for the determination of exhaust gas flow using process or control device operating parameter measurements and a conversion equation, a graph, or computer program to produce results in cubic feet per hour.

(c) The PFMS shall meet the following performance specifications:

(1) Sensors readings and conversion of sensor data to flow in cubic feet per hour must be automated.

(2) The PFMS must allow for the automatic or manual determination of failed monitors. At a minimum a daily determination must be performed.

(3) The PFMS shall have provisions to check the calibration error of each parameter that is individually measured. The owner or operator shall propose appropriate performance specifications in the initial monitoring plan for all parameters used in the PFMS comparable to the degree of accuracy required for other monitoring systems used to comply with this Rule. The parameters shall be tested at two levels, low: 0 to 20% of full scale, and high: 50 to 100% of full scale. The reference value need not be certified.

(4) The relative accuracy of the PFMS must be $\leq$ 10.0% of the reference method average value, and include a bias test in accordance with paragraph 4(c) of this section.

3. Certification Requirements

The PFMS is subject to initial certification testing as follows:

(a) Demonstrate the ability of the PFMS to identify automatically or manually a failed monitor.

(b) Provide evidence of calibration testing of all monitoring equipment. Any tests conducted within the previous 12 months of operation that are consistent with the QA/QC plan for the PFMS are acceptable for initial certification purposes.

(c) Perform an initial relative accuracy test over the normal range of operating conditions

of the kiln. Using the results of the relative accuracy test audit, conduct a bias test in accordance with Appendix A to 40 CFR Part 75, and calculate and apply a bias adjustment factor if required.

4. Quality Assurance/Quality Control Requirements

A QA/QC plan shall be developed and implemented for each PFMS in compliance with sections 1 and 1.1 of Appendix B of 40 CFR Part 75, and the following:

(a) Perform a daily monitor failure check.

(b) Perform calibration tests of all monitors for each parameter included in the PFMS. At a minimum, calibrations shall be conducted prior to each relative accuracy test audit.

(c) Perform a relative accuracy test audit and accompanying bias test once every four operating quarters. Calculate the relative accuracy (and bias adjustment factor) as described in Appendix A to 40 CFR Part 75. An out of control period occurs whenever the flow relative accuracy is greater than 10.0% of the mean value of the reference method.

5. Missing Data

For any period in which valid data are not being recorded by the PFMS specified in this section, hourly missing or invalid data shall be replaced with substitute data in accordance with the flow monitor missing data requirements for non-load based units in Subpart D of 40 CFR Part 75.

6. Monitoring Plan Requirements

In addition to the general monitoring plan requirements of Section I of this Rule, the owner or operator shall meet the following additional requirements:

(a) The monitoring plan shall document the reasons why stack flow measurements upstream of the fabric filter are unlikely to provide reliable flow measurements over time.

(b) The initial monitoring plan shall explain the relationship of the proposed parameters and stack flow, and discuss other parameters considered and the reasons for not using those parameters in the PFMS. The [state or tribe] may require that the subsequent monitoring plan include additional explanation and documentation for the reasonableness of the proposed PFMS.

F. (Reserved)

G. (Reserved)

H. (Reserved)

I. Pollution Prevention

1. Utah Renewable Energy Program Descriptions

a. Utility Integrated Resources Planning

(1) PacifiCorp Integrated Resource Planning – Renewable Additions

Program / Initiative: Utility Integrated Resource Planning Program – PACIFICORP – Renewable power generation additions.	Start Date: End Date:
Sponsoring Organizations: Public Service Commission of Utah	Lead Contact:
Implementing Organization: PACIFICORP in consultation with the Public Service Commission, its staff, the Division of Public Utilities, the Committee of Consumer Services, appropriate Utah agencies and other interested parties.	Lead Contact:
Funding Source: Utah customers of PacifiCorp through electricity rates approved by the Utah Public Service Commission $ Total: $ per year:	
Installed Generation Capacity: Cumulative Installed MW capacity (wind) – 2005 – 60MW 2006 – 186MW 2007 – 318MW 2008 – 414MW 2009 – 546 MW 2010 – 687 MW 2011 – 834 MW 2012 – 981 MW 2013 – 1,146MW	Renewable Contribution to the Portfolio: Percent of Renewable Generation 2005 – 1.0% 2006 – 1.6% 2007 – 2.2% 2008 – 2.8% 2009 – 3.4% 2010 – 4.0% 2011 – 4.6% 2012 – 5.2% 2013 – 5.8%
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Public Service Commission of Utah (UPSC) requires PacifiCorp to pursue the least cost alternative for the provision of electric energy services to its present and future ratepayers that is consistent with safe and reliable service, the fiscal requirements of a financially healthy utility, and the long-run public interest. The UPSC has adopted integrated resource planning (IRP) rules to meet these goals and periodically reviews plans PacifiCorp submits to assure new utility resource acquisitions are consistent with the UPSC IRP Standards and Guidelines and are likely to yield the optimal set of resources given the expected combination of costs, risks and uncertainty. Among other requirements, the UPSC IRP rules require PacifiCorp to consider environmental externalities and their costs explicitly and to evaluate supply-side and demand-side resources on a consistent and comparable basis. All technically feasible and cost-effective improvements in the efficient use of electricity,	

including load management and conservation must be evaluated. Similarly, all technically feasible generating technologies, including renewable resources, cogeneration, power purchases from other sources and the construction of thermal resources, must be assessed. PacifiCorp must submit its Integrated Resource Plan to the UPSC biennially. PacifiCorp has committed itself to updating its IRP annually. The IRP process must be thoroughly documented and afford ample opportunity for public input and information exchange. PacifiCorp's Strategic Business Plan must be related to its Integrated Resource Plan. An outline of the specific resource decisions intended to implement the Integrated Resource Plan in a manner consistent with the PacifiCorp Strategic Business Plan must be supplied to the UPSC. The UPSC IRP Standards and Guidelines must meet the needs of PacifiCorp's Utah service area, but must not ignore the rules governing similar processes in other jurisdictions to foster coordinated regional planning. The UPSC REPORT AND ORDER ON STANDARDS AND GUIDELINES, Docket No. 90-2035-01, articulates Utah's Integrated Resource Planning requirements.
Program Components: PacifiCorp plans to purchase contracts for over 1,000MW of wind generation from 2003 – 2013. Solar and geothermal opportunities will also be examined on a case-by-case basis for economic merit and inclusion in the portfolio. Based on further analysis and clarification of wind and other renewable power capabilities, PacifiCorp expects to include additional cost effective wind capacity in their portfolio. These renewable power acquisitions will be included in the rates consumers pay for power. Utah customers have historically paid 38% of PacifiCorp's overall revenue requirement in their rates. Because Utah customers will be paying for 38% of the renewable power generation additions PacifiCorp plans to acquire for its portfolio, Utah can claim 38% of these renewable power additions toward meeting the 10/20 goals articulated in Section 309 of the Regional Haze Rule.

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3. 4.			

(2) UAMPS Integrated Resource Planning

Program / Initiative: Utah Associated Municipal Power Systems (UAMPS) Integrated Resource Planning Program – Demand Side Management	Start Date: End Date:
Sponsoring Organizations: Western Area Power Administration under the National Energy Policy Act of 1992	Lead Contact:

Implementing Organization: Utah Associated Municipal Power Systems and its members	Lead Contact:
Funding Source: $ Total: $ per year:	
Direct Energy Savings:	Indirect Energy Savings:

Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): UAMPS is a project wholesale generation and transmission entity. Municipal utilities who are members purchase power from UAMPS through project contracts and re-sell it to their retail customers. Each member is solely responsible to meet its load requirements. Members can meet their electricity needs through UAMPS or any other source. UAMPS does not have sole responsibility to serve its members' loads. As a result, UAMPS can only coordinate its Integrated Resource Planning Program activities with members. UAMPS is not regulated by the Utah Public Service Commission. UAMPS prepares an Integrated Resource Plan and files it with the Western Area Power Administration (Western) to satisfy Western's regulations and requirements contained in the National Energy Policy Act of 1992. UAMPS filed its "Integrated Resource Plan 2002" with Western. Western accepted the plan on December 27, 2002. UAMPS' "Integrated Resource Plan 2002" covered a ten year planning period, but focused primarily on actions to be taken within the next five years. The Integrated Resource Planning Program is an ongoing, dynamic process in which resource choices are continually under review and re-examination. UAMPS fundamental goal is to provide reliable, competitively priced, and environmentally acceptable power to its members. The Integrated Resource Planning Program strives to achieve this goal and effectively balance its objectives to minimize impacts on member rates, match operational need, maintain system reliability, minimize adverse environmental impacts, ensure flexibility, ensure short-term and long-terms needs are met and maintain diversity in its resource mix and market areas. UAMPS seeks member and public input on all of these matters through its Integrated Resource Planning Program.

Program Components:

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3. 4.			

b. Utah Net Metering Program

Program / Initiative: Utah Net Metering Program	Start Date: End Date:		
Sponsoring Organizations: All electrical corporations within Utah as required by Utah Code Sections 54-15-101 through 54-15-106	Lead Contact:		
Implementing Organization: For each distribution electrical cooperative within Utah, their Board of Directors; for all other electrical corporations within Utah, the Utah Public Service Commission.	Lead Contact:		
Funding Source: $ Total: $ per year:			
Direct Energy Savings:	Indirect Energy Savings:		
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Utah Net Metering Program must be offered by all electrical corporations serving Utah loads. By law, electrical corporations must allow customers with a generation system meeting the Net Metering Program requirements to generate electricity for their own primary use, supply customer-generated power to the electrical corporation and receive a credit for any excess customer-generated power produced during a billing period against the cost of electricity supplied by the electrical corporation within the same calendar year. Excess customer-generated power is the amount by which customer-generated power exceeds what has been delivered to the customer by an electrical corporation in a given billing period. All credits a customer earns, but fails to use during a calendar year expire at the end of the calendar year. To qualify for the Utah Net Metering Program, the customer generation system must be a fuel cell or generate power using the sun, wind or water. A customer generation system must have a capacity less than or equal to 25 kilowatts and be located on the customer's premise to participate in the Utah Net Metering Program. All electrical corporations serving Utah customers must permit their customers to interconnect to their transmission and distribution network so they can participate in the Net Metering Program. The customer generation system needs to meet specific requirements for interconnecting to the electrical corporation's network. An electrical corporation can discontinue offering the Net Metering Program as long as the cumulative generating capacity from customer-generators on their system equals at least 0.1% of the electrical corporation's peak demand during 2001 and at least half of the electricity counted toward the 0.1% is generated by renewable sources. Utah Code Sections 54-15-101 through 54-15-106 authorize the Net Metering Program.			
Program Components:			
Organization name / Contact 1. PacifiCorp Net Metering	Participants	Investment	Energy Savings

Service – Electric Service Schedule Number 135 2. Other electric corporation tariffs or Board policies. 3. 4.			

c. Green Pricing: PacifiCorp Blue Sky Marketing Program

Program / Initiative: Green Power Marketing – PACIFICORP "Blue Skies"	Start Date: November 2, 2001 End Date:
Sponsoring Organizations: PacifiCorp with approval of the Utah Public Service Commission	Lead Contact:
Implementing Organization: PacifiCorp	Lead Contact:
Funding Source: Ratepayers who agree to purchase blocks of renewable power to satisfy all or a portion of their demand $ Total: $ per year:	
Installed Generation Capacity:	Renewable Contribution to the Portfolio:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The PacifiCorp "Blue Skies" Program allows certain classes of the Utah customers it serves to purchase blocks of new wind, geothermal and solar power to satisfy all or a portion of their demand. PacifiCorp's Utah customers receiving electric service under Schedules 1, 2, 6, 6A, 9, 9A, 9B, 10, 19, 21, 23, 23B, or 25 anywhere on its interconnected system may elect to buy blocks of new wind, geothermal and solar generated power through this program. New wind, geothermal and solar generated power is available in blocks of 100KWh per block. Each block a customer agrees to purchase costs them $2.95/month. The charge for each block a customer agrees to purchase is added to all other charges contained in that customer's applicable tariff schedule. The customer is charged for each block they agree to purchase regardless of their actual electricity consumption. Eligible customers may apply to purchase or terminate their purchases anytime during the year. PacifiCorp does not permit customers that have a time payment agreement, have received one or more disconnect notices or have been disconnected within the last 12 months to enroll in the "Blue Skies" Program. PacifiCorp guarantees participating customers it will acquire and deliver new wind, geothermal	

and solar generated power within two years of their subscription to the "Blue Skies" Program. "Blue Skies" Program service is supplied according to the terms of an Electric Service Agreement it enters with participating customers. The Utah Public Service Commission approves the contents of these Electric Service Agreements. PacifiCorp's "Blue Skies" Program has been authorized by the Utah Public Service Commission in PacifiCorp's tariff, Electric Service Schedule 70.			
Program Components:			
Organization name / Contact 1. 2. 3. 4.	Participants	Investment	Energy Savings

d. Financial Incentives: Renewable Energy Systems Tax Credit Program

Program / Initiative: Renewable Energy System Tax Credit Program	Start Date: January 1, 2001 End Date: December 31, 2006
Sponsoring Organizations: State of Utah	Lead Contact:
Implementing Organization: Utah Department of Natural Resources, Utah Energy Office	Lead Contact:
Funding Source: $ Total: $ per year:	
Direct Energy Savings:	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): Utah offers individual taxpayers and business entities an income tax credit for buying and installing any active solar, passive solar, wind or hydropower system to supply all or part of the energy to the taxpayer's pertinent residence or commercial unit. Business entities can also claim an income tax credit for buying and installing biomass systems and investing in commercial renewable energy systems to generate power for commercial sale. Taxpayers can claim the income tax credit on renewable energy systems purchased and	

installed between January 1, 2001 and December 31, 2006. The income tax credits provided under this program are in addition to any federal tax credits. The Utah Energy Office has the authority to promulgate standards addressing safety, reliability, efficiency, leasing and technical feasibility that residential and commercial renewable energy systems must meet to earn an income tax credit. Income tax credits can not be taken until the Utah Energy Office has certified that the renewable energy system has been completely installed and is a viable system for saving or producing energy from renewable resources.			
Program Components: Residential renewable energy system tax credit for individual taxpayers and commercial renewable energy system tax credit for business entities			
Organization name / Contact 1. 2. 3. 4.	Participants	Investment	Energy Savings

e. Government Endorsed Green Power Purchases

(1) Supplemental Environmental Project Program

Program / Initiative: SUPPLEMENT ENVIRONMENTAL PROJECTS (SEPs)	Start Date:
	End Date:
Sponsoring Organizations: Utah Department of Environmental Quality, Air Quality Division	Lead Contact: Rick Sprott
Implementing Organization: Air permit violators through escrow established to purchase power from PacifiCorps' Blue Sky program	Lead Contact:
Funding Source: Private funds collected as part of settlements to resolve air quality permit violations. $ Total: $ per year: Varies based on the number and nature of air quality permit violations and the willingness of violators to participate in a SEP.	
Direct Energy Savings:	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): In settlements of air quality enforcement actions, the Utah Division of Air Quality requires alleged violators to achieve and stay in compliance with their permit provisions and all applicable federal and state air quality laws and regulations and pay a civil penalty. In certain circumstances environmentally beneficial projects or Supplemental Environmental Projects	

(SEPs) may be part of the settlement.

SEPs are environmentally beneficial projects a defendant in an air quality enforcement action agrees to undertake as part of a settlement, but are not otherwise legally required. In return a percentage of the SEP costs may be used to mitigate the penalty paid by the defendant. All else being equal a final settlement penalty will be lower for a violator who performs an acceptable SEP.

A SEP must improve, protect or reduce risk to public health or the environment. EPA has identified seven specific categories of projects which may qualify as SEPs, including, Pollution Prevention". A pollution prevention project "…reduces the amount of pollution through source reduction" and "protects natural resources through conservation or increased efficiency in the use of energy, water or other materials.[4]" Energy conservation, efficiency and renewable energy programs can be incorporated into an approvable Supplemental Environmental Project.

The Utah Division of Air Quality has no authority to require alleged violators to perform SEPs. Alleged violators have sole discretion over whether or not to offer SEPs to help resolve air quality enforcement actions taken against them. The Utah Division of Air Quality will consider renewable energy SEPs, such as long-term purchases of PacifiCorps' Blue Sky "green power" product or the construction of new renewable energy generation capacity, as a Supplement Environmental Project option to settle air quality enforcement actions. Renewable energy SEPs approved by the Utah Divison of Air Quality will contribute directly to meeting their 10/20 renewable energy goals.

Program Component Summary:

Component Name & Lead Contact	Number of Participants	Investment	Energy Savings	
			Direct	Indirect
1.				
2.				
3.				
4.				
Total				

(2) Salt Lake City Climate Action Plan Program

Program / Initiative: Salt Lake City Local Climate Action Plan	Start Date: February 2002
	End Date: Ongoing through 2012
Sponsoring Organizations: Salt Lake City Corporation	Lead Contact: Lisa Romney, (801) 535-7939

[4] See "Categories for Supplemental Environmental Projects," pg. 6, EPA Supplemental Environmental Projects Policy, issued May 1, 1998.

Implementing Organization: Salt Lake City Corporation	Lead Contact: Lisa Romney, (801) 535-7939
Funding Source: Existing city budgets $ Total: $ per year:	
Direct Energy Savings: Efficient lighting retrofits $33,571 in first year LED traffic signal lights $32,962 in first year	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Salt Lake City Corporation, using Cities for Climate Protection software, has developed an action plan for Salt Lake City to comply with goals articulated in the Kyoto Protocol. While focused on reducing greenhouse gas emissions, the plan replies on energy efficiency improvements and renewable energy power purchases to accomplish its purpose. Phase I of the action plan addresses steps Salt Lake City government can take to improve its energy usage and purchase less polluting power and fuel supplies for its operations. Under Phase I of its plan, Salt Lake City has already completed energy efficient lighting retrofits, installed more efficient LED traffic signals, purchased "green", wind power from PacifiCorp under its Blue Sky program and substituted bio-diesel, B-20, fuel for regular diesel fuel in its airport vehicles. Salt Lake City has committed to investigate and implement additional energy efficiency and renewable energy projects in the future. Salt Lake City plans to concentrate on reducing vehicles emissions through expansions of its mass transit system and improving heating, air conditioning and ventilation systems efficiencies in city buildings. Salt Lake City government projects are intended to set standards for responsible growth and resource use in the local area. Phase II of the action plan extends its application to the entire community. Salt Lake City has already begun to promote and market energy efficiency programs and renewable energy consumption to its businesses and citizenry. For example, Salt Lake City recently joined PacifiCorp on a direct-mail marketing campaign of the Blue Sky, "green power", program and sponsors E2 Business awards to recognize and promote businesses that meet environmental improvement and economic welfare goals.	
Program Components:	

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3. 4.			

f. Technical Assistance: Million Solar Roofs Partnership Program

Program / Initiative: Million Solar Roofs Partnership	Start Date: 2002
	End Date:
Sponsoring Organizations: Office of the Mayor, Salt Lake City through the U.S. Department of Energy	Lead Contact: Lisa Romney - (801) 535-7939
Implementing Organization: Office of the Mayor, Salt Lake City	Lead Contact:
Funding Source: U.S. Department of Energy $ Total: $ per year:	
Direct Energy Savings: Technical support program to the Utah Public Service Commission	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Million Solar Roofs Partnership Program is a U. S. Department of Energy initiative to install solar systems on one million buildings within the United States by 2010. Through its partnership with the U.S. Department of Energy, Salt Lake City is seeking to get 500 buildings within the city to install solar systems by 2010. The Salt Lake City Million Solar Roofs Partnership Program provides technical expertise to the Utah Public Service Commission to substantiate the cost effectiveness of partial utility funding for rooftop photovoltaic systems as one means for them to fulfill customer power demands. By clarifying the cost effectiveness of utility incentive payments for photovoltaic systems within Salt Lake City, the Office of the Mayor seeks to remove market barriers to entry and develop and strengthen demand for solar energy products locally. The Salt Lake City Million Solar Roof Partnership Program is intended to transform the local electricity market place and stimulate new technology application.	
Program Components:	

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3. 4.			

2. Utah Energy Efficiency Program Descriptions

a. Utility Integrated Resource Planning

(1) PacifiCorp Integrated Resource Planning – Demand Side Management

<table>
<tr><td>Program / Initiative: Utility Integrated Resource Planning Program – PACIFICORP – Demand Side Management</td><td>Start Date:
End Date:</td></tr>
<tr><td>Sponsoring Organizations: Public Service Commission of Utah</td><td>Lead Contact:</td></tr>
<tr><td>Implementing Organization: PACIFICORP in consultation with the Public Service Commission, its staff, the Division of Public Utilities, the Committee of Consumer Services, appropriate Utah agencies and other interested parties.</td><td>Lead Contact:</td></tr>
<tr><td colspan="2">Funding Source: Utah ratepayers
$ Total: FY2003, $21,920,642; FY2004, $22,290,148; FY2005, $20,001,513; FY2006, $13,150,000; FY2007, $13,150,000; FY2008, $13,150,000; FY2009, $13,150,000; FY2010, $13,150,000; FY2011, $13,150,000; FY2012, $13,150,000.</td></tr>
<tr><td>Direct Energy Savings:
Fiscal Year MWa MWH
2003 12.13 106,246
2004 12.71 111,297
2005 13.70 120,044
2006 12.34 108,130
2007 9.00 78, 840
2008 9.00 78,840
2009 9.00 78,840
2010 9.00 78,840
2011 9.00 78,840
2012 9.00 78,840</td><td>Indirect Energy Savings:</td></tr>
<tr><td colspan="2">Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Public Service Commission of Utah (UPSC) requires PacifiCorp to pursue the least cost alternative for the provision of electric energy services to its present and future ratepayers that is consistent with safe and reliable service, the fiscal requirements of a financially healthy utility, and the long-run public interest. The UPSC has adopted integrated resource planning (IRP) rules to meet these goals and periodically reviews plans PacifiCorp submits to assure new utility resource acquisitions are consistent with the UPSC IRP Standards and Guidelines and are likely to yield the optimal set of resources given the expected combination of costs, risks and uncertainty. Among other requirements, the UPSC IRP rules require PacifiCorp to consider environmental externalities and their costs explicitly and to evaluate supply-side and demand-side resources on a consistent and comparable basis. All technically feasible and cost-effective improvements in the efficient use of electricity, including load management and conservation must be evaluated. Similarly, all technically feasible generating technologies, including renewable resources, cogeneration, power purchases from other sources and the construction of thermal resources, must be assessed. PacifiCorp must submit its Integrated Resource Plan to the UPSC biennially. PacifiCorp has</td></tr>
</table>

committed itself to updating its IRP annually. The IRP process must be thoroughly documented and afford ample opportunity for public input and information exchange. PacifiCorp's Strategic Business Plan must be related to its Integrated Resource Plan. An outline of the specific resource decisions intended to implement the Integrated Resource Plan in a manner consistent with the PacifiCorp Strategic Business Plan must be supplied to the UPSC. The UPSC IRP Standards and Guidelines must meet the needs of PacifiCorp's Utah service area, but must not ignore the rules governing similar processes in other jurisdictions to foster coordinated regional planning. The UPSC REPORT AND ORDER ON STANDARDS AND GUIDELINES, Docket No. 90-2035-01, articulates Utah's Integrated Resource Planning requirements.

Program Components: The energy efficiency measures PacifiCorp employs for Demand Side Management (DSM) in its IRP program vary in dispatchability, firmness of results, term of the load reduction benefit and persistence over time. PacifiCorp separates DSM measures it offers into four general classes or components. Class 1 – Fully dispatchable DSM resources. Load reductions from this group of measures occur through active customer load controls. Once customers agree to participate in Class 1 DSM measures, the timing and duration of any load reduction is involuntary on their part within limits and parameters to which they have previously agreed. Examples include residential and commercial central air conditioner load control, irrigation load control, electric water heat load control and interruptible tariffs. Class 2 – Non dispatchable, growth neutral DSM resources. Energy and capacity savings from this group of measures are realized through technological improvements in appliances, equipment or structures. Savings last for the life of the installed systems. Reductions in power usage do not affect business or economic output. Examples include incentives to replace existing or upgrade new customer-owned equipment such as lights, motors, air conditioning systems, etc. Class 3 – Non dispatchable, load shedding buydown DSM measures. Energy and capacity savings from this set of measures have a short duration and are achieved through voluntary actions customers take in response to financial incentives PacifiCorps offers them to reduce loads. Examples include Energy Exchange and curtailable tariffs. Class 4 – Non dispatchable, conservation education measures. Energy and capacity savings stem from behavioral changes better informed customers make. Example include Power Forward, 20/20 Customer Challenge, public education and awareness campaigns to promote power savings through conservative thermostat settings, turning off appliances when not in use and inverted block and time-of-use pricing structures.

Organization name / Contact	Participants	Investment	Energy Savings
1.			
2.			
3.			
4.			

(2) *UAMPS Integrated Resource Planning – Demand Side Management*

Program / Initiative: Utah Associated Municipal Power Systems (UAMPS) Integrated	Start Date:

Municipal Power Systems (UAMPS) Integrated Resource Planning Program – Demand Side Management	End Date:
Sponsoring Organizations: Western Area Power Administration under the National Energy Policy Act of 1992	Lead Contact:
Implementing Organization: Utah Associated Municipal Power Systems and its members	Lead Contact:
Funding Source: $ Total: $ per year:	
Direct Energy Savings:	Indirect Energy Savings:

Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): UAMPS is a project wholesale generation and transmission entity. Municipal utilities who are members purchase power from UAMPS through project contracts and re-sell it to their retail customers. Each member is solely responsible to meet its load requirements. Members can meet their electricity needs through UAMPS or any other source. UAMPS does not have sole responsibility to serve its members' loads. As a result, UAMPS can only coordinate its Integrated Resource Planning Program activities with members. UAMPS is not regulated by the Utah Public Service Commission. UAMPS prepares an Integrated Resource Plan and files it with the Western Area Power Administration (Western) to satisfy Western's regulations and requirements contained in the National Energy Policy Act of 1992. UAMPS filed its "Integrated Resource Plan 2002" with Western. Western accepted the plan on December 27, 2002. UAMPS' "Integrated Resource Plan 2002" covered a ten year planning period, but focused primarily on actions to be taken within the next five years. The Integrated Resource Planning Program is an ongoing, dynamic process in which resource choices are continually under review and re-examination. UAMPS fundamental goal is to provide reliable, competitively priced, and environmentally acceptable power to its members. The Integrated Resource Planning Program strives to achieve this goal and effectively balance its objectives to minimize impacts on member rates, match operational need, maintain system reliability, minimize adverse environmental impacts, ensure flexibility, ensure short-term and long-terms needs are met and maintain diversity in its resource mix and market areas. UAMPS seeks member and public input on all of these matters through its Integrated Resource Planning Program.

Program Components: Demand side management activities supported by UAMPS across its member system; demand side management activities underwritten by individual members on their systems

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3.			

4.			

b. Residential Energy Efficiency

(1) Low-income Weatherization Program

Program / Initiative: Low-income Residential Weatherization Program	Start Date: July 1, 1975 End Date: Ongoing
Sponsoring Organizations: Utah Division of Community Development with the U.S. Department of Energy	Lead Contact: Michael Johnson - (801) 538-8657
Implementing Organization: Bear River Association of Governments, Davis County Aging Services, Salt Lake Community Action Program, Housing Authority of Utah County, Six County Association of Governments, Five County Association of Governments, Uintah Basin Association of Governments, and Southeastern Utah Association of Local Governments	Lead Contact:
Funding Source for Fiscal Year 2002-2003: $2,102,745 US DOE Weatherization Grant $1,137,523 Low-income Home Energy Assistance Program Transfer $1,030,435 TANF Grant $ 300,000 Utah Power/PacifiCorp Grant $ 250,000 Questar Gas $ 16,000 State of Utah $ Total: $4,836,703 $ per year:	
Direct Energy Savings:	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Low-income Residential Weatherization Program makes one-time energy efficiency improvements to dwellings occupied by low-income Utahans, reducing their energy costs while safeguarding their health and safety. Occupants must meet income guidelines established by the U.S. Department of Energy and the State of Utah to qualify to have energy saving improvements made to their dwelling through the program. Qualified low-income applicants' dwellings are audited to assess their energy performance and to identify the most effective energy saving measures to install using the National Energy Audit Tool (NEAT). NEAT is a software program developed for the program by the Oak Ridge National Laboratory. Based on the audit results, energy measures are incorporated into the dwelling and/or more efficient appliances are substituted for inefficient ones. Energy efficiency measures that may be taken at low-income residences include, but are not limited to, ceiling, wall, floor, foundation, duct, water heater and pipe insulation, combustion appliance testing,	

tune-ups, repairs and replacement, home envelop infiltration testing and leakage sealing, duct leakage testing and sealing, compact fluorescent lighting substitutions, electrical appliance replacement, health and safety improvements and energy related repairs. Low-income program participants also receive information on additional steps they can take to save energy and reduce their energy bills. Local public and non-profit agencies that work with low-income citizens carry out the program. On a national basis, natural gas consumption in low-income dwellings participating in the program has been reduced 21.9% compared to their usage before weatherization. To date, 47,500 homes with low-income residents have been weatherized.
Program Components:

Organization name / Contact	Participants	Investment	Energy Savings
1. 2. 3. 4.			

(2) Residential Energy Efficiency Program

Program / Initiative: Residential Energy Efficiency Program	Start Date: End Date:
Sponsoring Organizations: Utah Energy Office; Utah Energy Conservation Coalition, Energy Rated Homes of Utah	Lead Contact: Mark S. Eldredge, (801) 765-0034; Cris Peterson and David A. Wilson, (801) 765-0034
Implementing Organization: Utah Energy Conservation Coalition and Energy Rated Homes of Utah	Lead Contact: Cris Peterson, David A. Wilson and (801) 765-0034
Funding Source: $ Total: $ per year:	
Direct Energy Savings:	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): Utah has adopted and enforces the residential energy efficiency building standards contained in the 2000 International Energy Conservation Code. The Utah Uniform Building Standards Act establishes statewide building energy construction standards. These standards are enforced by local building inspectors. Utah trains inspectors and offers technical assistance to code enforcement officials to assure new home construction meets specified energy performance standards. In addition, Utah sponsors numerous market-based activities to help home owners identify cost-effective energy efficiency improvements they can incorporate into their homes, to give home buyers information they can use to distinguish	

energy efficient homes from other, less energy efficient homes that might be on the market, and to offer more attractive home financing terms to energy efficient home buyers. Utah has made a commitment to improving its "as built" environment by promoting a resource efficient, sustainable and ecologically friendly "whole-systems" approach to home building practices.			
Program Components: Residential Energy Code, Residential Energy Code Training, Residential Energy Auditor Training, Home Energy Rating System, Energy Efficient Mortgages, and Greenenergy Homes Initiative			
Organization name / Contact	Participants	Investment	Energy Savings
1. Utah Department of Commerce, Division of Occupational and Professional Licensing		$70,000 FY2002/2003	
2. Utah Energy Conservation Coalition/Mark S. Eldredge			$350,000+/year
3. Utah Energy Conservation Coalition/David A. Wilson			
4. Utah Energy Conservation Coalition and Energy Rated Homes of Utah/Cris Peterson			
5. Utah Energy Conservation Coalition and Energy Rated Homes of Utah/Cris Peterson			
6. Utah Energy Conservation Coalition and Energy Rated Homes of Utah/Cris Peterson			

c. Commercial and Industrial Energy Efficiency

(1) Commercial and Industrial Energy Efficiency Demonstration Program

Program / Initiative: Commercial and Industrial Energy Efficiency Demonstration Loan Program	Start Date: 1997
	End Date: May 2000 although 33% of loans remain active and energy savings persist
Sponsoring Organizations: Utah Energy Office	Lead Contact: Jon Allred, (801) 538-4713
Implementing Organization: Participating industrial and commercial facilities	Lead Contact:

Funding Source: Petroleum Violation Escrow Account funds $ Total: $1,390,000 $ per year:			
Direct Energy Savings: Approximately $250,000 annually	Indirect Energy Savings:		
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Utah Commercial and Industrial Energy Efficiency Demonstration Loan Program offered low-interest loans to finance the incremental costs of installing energy efficient process and system improvements and equipment replacements in commercial and industrial establishments. Participating commercial businesses and industries conducted energy audits to identify cost-effective energy saving measures for which they sought loan financing from the program. The energy efficiency measures funded by the program were projected to payback initial investments through energy savings in five years or less. Approximately 67% of the original loan amounts have already been repaid. No new loans are being made since the program was designed to demonstrate the benefits commercial and industrial participants could derive from making energy efficient improvements and stimulate future private investment from conventional lenders. The Utah Energy Office may continue to monitor the energy savings from each loan project, resolve project issues, and collect any outstanding account delinquencies.			
Program Components:			
Organization name / Contact 1. 2. 3. 4.	Participants	Investment	Energy Savings

(2) Industries of the Future Program

Program / Initiative: Industries of the Future	Start Date: May, 1999
	End Date: August 28, 2005 unless extended by mutual agreement
Sponsoring Organizations: U.S. Department of Energy and the State of Utah	Lead Contact: Jack Jenkins (303) 275-4824 and Jon Allred (801) 538-4713
Implementing Organization: Utah Energy Office, Utah Department of Natural Resources	Lead Contact: Jon Allred (801) 538-4713
Funding Source: $100,000 – US Department of Energy 48,000 – Petroleum Violation Escrow Account $ Total: $148,000	

$ per year:			
Direct Energy Savings:		Indirect Energy Savings:	
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): Utah's Industries of the Future Program encourages collaboration among industry, trade associations, academia, and the national laboratories to evaluate, develop, demonstrate and deploy more energy efficient industrial technologies, processes and practices. The program focuses on energy efficiency gains in eight large industrial sectors – agriculture, aluminum, forest products, chemicals, mining, metal casting, petroleum and steel. These industries are important to the Utah economy and use large amounts of heat, fuel and power. The Industries of the Future Program fosters cost-shared research and development partnerships to improve industrial energy and materials use. The Utah Energy Office, Utah Department of Natural Resources, shares information on best energy efficiency and renewable energy practices with key industries, sponsors industry forums and helps industry access federal laboratories and funding sources to accelerate the development and commercial use of advanced, energy and materials conserving processes and technologies. Utah has provided over 4000 companies with descriptions of "best practices", a body of energy saving options for industries that includes easy-to-use energy savings calculators, motor-sizing formulas, software and other resources to aid managers in reducing their energy consumption per unit of production. Utah is monitoring industries' response through surveys to assess the shop floor changes that have been adopted as a response to the program.			
Program Components:			
Organization name / Contact 1. 2. 3. 4.	Participants	Investment	Energy Savings

d. Schools and Public Buildings Energy Efficiency Programs

(1) State Buildings Energy Efficiency Program

Program / Initiative: State Building Energy Efficiency Program (SBEEP)	Start Date: June 23, 1999
	End Date: 2010 unless Executive Order is extended

Sponsoring Organizations: Governor's Office of the State of Utah	Lead Contact:
Implementing Organization: State of Utah, Department of Natural Resources, Utah Energy Office	Lead Contact: Mike Glenn (801) 538-5436

Funding Source: Funding for SBEEP comes from a variety of sources including settlement funds held in Petroleum Violation Escort accounts, federal energy program funds and a portion of the energy savings generated through SBEEP. The most significant source of funding is private capital that Energy Services Companies are willing to invest through performance contracts with the State of Utah.

$ Total:

$ per year: In Fiscal Year 2003, $331,602 has been budgeted to administer this program.

Direct Energy Savings: $3,067,473 through June 30, 2002	Indirect Energy Savings:

Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The State Buildings Energy Efficiency Program (SBEEP) is a comprehensive, multi-faceted set of activities designed to reduce energy costs for Utah government buildings by a cumulative total savings of $20 million by 2010. SBEEP activities include energy efficient improvements to existing state facilities, retro-commissioning to optimize efficiency gains from these improvements, technical engineering assistance, energy efficient new building design standards and incentives, a statewide energy management system for tracking energy use, education and training for building occupants and managers, and promotion of energy efficient equipment purchases by state agencies.

The State Buildings Energy Efficiency Program was authorized by the Quality Growth Act of 1999 (HB 119, 1999 General Session) and is being implemented through Executive Order of the Governor. SBEEP applies to each state agency, including each executive, legislative, and judicial branch department, agency, board, commission, or division and each state educational institution.

Program Components: Existing building retrofits, new construction standards and design review, building commissioning and re-commissioning, energy efficient procurement and systematic energy management, tracking and training.

Organization name / Contact	Participants	Investment	Energy Savings
1. Utah Department of Natural Resources, Utah Energy Office/Mike Glenn (801) 538-5436 2. Utah Department of Natural Resources, Utah Energy Office/Jim Hood (801) 538-5251 3. Utah Department of Natural Resources, Utah Energy Office/Jim Hood (801) 538-5251 4. Utah Division of			

Purchasing/Reed Taylor (801) 538-3709			

(2) Schools and Public Buildings Energy Efficiency Program

Program / Initiative: Schools and Public Buildings Energy Efficiency Program	Start Date:
	End Date:
Sponsoring Organizations: Utah Energy Office	Lead Contact: Bernell Loveridge, (801) 538-5413
Implementing Organization: Utah Energy Office, Utah Office of Education	Lead Contact: Bernell Loveridge, (801) 538-5413; Larry Newton, (801) 538-7668
Funding Source: Funding for the Schools and Public Buildings Energy Efficiency Program activities comes primarily from settlement funds held in Petroleum Violation Escort accounts. Another significant source for funding may be private capital that Energy Services Companies are willing to invest through performance contracts with schools and local government entities. $ Total: $1,870,000 $ per year:	
Direct Energy Savings: Over $620,000 per year	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): Utah offers a broad range of technical assistance, energy auditing and financial assistance services to schools and units of local government through its Schools and Public Buildings Energy Efficiency Program. For purposes of this program, units of local government include cities, towns, counties, sewer districts and public buildings such as libraries and recreational facilities. The Schools and Public Buildings Energy Efficiency Program helps local governments to identify and finance energy efficiency improvements within their existing buildings and the facilities they operate and maintain. This program also supports engineering reviews of plans for new schools and additions to existing schools as well as on-site construction inspections to assure school buildings comply with current energy code requirements.	
Program Components: Auditing and technical assistance to identify cost-effective energy efficiency improvements local governments can make to their existing buildings and the facilities they operate and maintain, a limited low interest loan pool for financing energy efficiency improvements in local government buildings, and new school design review and inspection assistance for assuring energy code compliance.	

Organization name / Contact	Participants	Investment	Energy Savings
1. Utah Energy Office; Bernell Loveridge, (801) 538-5413		$60,000	
2. Utah Energy Office; Bernell Loveridge, (801)		$1,800,000	About $620,000/year

538-5413 3. Utah Office of Education; Larry Newton, (801) 538-7668 4.		$10,000	

(3) Salt Lake City Climate Action Plan Program

Program / Initiative: Salt Lake City Local Climate Action Plan	Start Date: February 2002 End Date: Ongoing through 2012
Sponsoring Organizations: Salt Lake City Corporation	Lead Contact: Lisa Romney, (801) 535-7939
Implementing Organization: Salt Lake City Corporation	Lead Contact: Lisa Romney, (801) 535-7939
Funding Source: Existing city budgets $ Total: $ per year:	
Direct Energy Savings: Efficient lighting retrofits $33,571 in first year LED traffic signal lights $32,962 in first year	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Salt Lake City Corporation, using Cities for Climate Protection software, has developed an action plan for Salt Lake City to comply with goals articulated in the Kyoto Protocol. While focused on reducing greenhouse gas emissions, the plan replies on energy efficiency improvements and renewable energy power purchases to accomplish its purpose. Phase I of the action plan addresses steps Salt Lake City government can take to improve its energy usage and purchase less polluting power and fuel supplies for its operations. Under Phase I of its plan, Salt Lake City has already completed energy efficient lighting retrofits, installed more efficient LED traffic signals, purchased "green", wind power from PacifiCorp under its Blue Sky program and substituted bio-diesel, B-20, fuel for regular diesel fuel in its airport vehicles. Salt Lake City has committed to investigate and implement additional energy efficiency and renewable energy projects in the future. Salt Lake City plans to concentrate on reducing vehicles emissions through expansions of its mass transit system and improving heating, air conditioning and ventilation systems efficiencies in city buildings. Salt Lake City government projects are intended to set standards for responsible growth and resource use in the local area. Phase II of the action plan extends its application to the entire community. Salt Lake City has already begun to promote and market energy efficiency programs and renewable energy consumption to its businesses and citizenry. For example, Salt Lake City recently joined PacifiCorp on a direct-mail marketing campaign of the Blue Sky, "green power", program and sponsors E2 Business awards to recognize and promote businesses that meet environmental improvement and economic welfare goals.	
Program Components:	

Organization name / Contact 1. 2. 3. 4.	Participants	Investment	Energy Savings

(4) Salt Lake Airport Electricity Conservation Program

Program / Initiative: Salt Lake Airport Electricity Conservation Program	Start Date: 1998 End Date: Ongoing
Sponsoring Organizations: Salt Lake City, Department of Airports Capitol Improvement Project Committee	Lead Contact:
Implementing Organization: Salt Lake City, Department of Airports	Lead Contact: John K. Cluff, (801) 575-2956
Funding Source: Revenues to the Salt Lake City Department of Airports $ Total: $ per year:	
Direct Energy Savings: $90,600 annually	Indirect Energy Savings:
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): The Salt Lake City Department of Airports manages a systematic program to identify and complete energy savings projects at the terminal, airport parking facilities and administrative offices. The Salt Lake City Department of Airports has already upgraded its terminal and concourse lighting using more energy efficient fixtures, installed occupancy sensors to eliminate unnecessary power usage, and improved power quality at the airport. Additional energy savings projects have been identified and work is underway to complete them. The Salt Lake City Department of Airports plans to continuously analyze its energy use and make further, economical facility improvements to conserve power.	
Program Components:	

Organization name / Contact 1. 2. 3.	Participants	Investment	Energy Savings

4.			

e. Technical Assistance

(1) Energy Education in Schools Program

Program / Initiative: Energy Education in Schools Program		Start Date: 1997 End Date: Ongoing	
Sponsoring Organizations: Various		Lead Contact:	
Implementing Organization: Utah Energy Office with cooperation from participating Utah School Districts		Lead Contact: Bernell Loveridge, Utah Energy Office, (801) 538-5413; Sunny Dent, National Energy Foundation, (801) 908-5800.	
Funding Source: U.S Department of Energy, Utah School Districts, Questar Gas, Johson Controls, Inc., Utah Energy Office $ Total: $ per year:			
Direct Energy Savings:		Indirect Energy Savings:	
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): Energy consumption in schools and homes is a function of systems, equipment and appliance efficiencies, occupant behavior and personal habits. Utah's Energy Education in Schools Program offers grade appropriate energy curriculum to teach students how to reduce energy consumption in their schools and homes through conscious, small behavioral changes and low-cost investments in more energy efficient technology. Students participating in the program are given opportunities to apply classroom lessons to help reduce energy usage at their school. The Program encourages participating schools to monitor energy consumption so students can observe the impact they can have on energy use when they are informed and conscientious.			
Program Components: Jordan School District Energy Action in Schools, Utah EnergySmart Schools in Action Program, and Energy Smart Schools Partnership			
Organization name / Contact	Participants	Investment	Energy Savings
1. Jordan School District Energy Action In Schools, Duane Devey, (801) 567-8770	Jordan School Dist., Utah Energy Office, Johnson Controls, Inc., Questar Gas	Between $14,000 and $121, 500 per year	
2. Utah EnergySmart Schools in Action Program,	Voluntary participation by Utah School Districts	FY2002-2003; $40,000	

Denise Beaudoin, (801) 567-8770 3. Energy Smart Schools Partnership, Bernell Loveridge, (801) 538-5413 4.			

(2) Power Forward Program

Program / Initiative: "PowerForward"		Start Date:	
		End Date:	
Sponsoring Organizations: Office of the Governor		Lead Contact: Natalie Gouchnor	
Implementing Organization: Partnership between state, local and federal government, communities, utilities, businesses, energy service companies and educators		Lead Contact: Jeff Burks	
Funding Source: $ Total: $ per year:			
Direct Energy Savings:		Indirect Energy Savings:	
Brief Narrative Summary of Project (include project purpose / intent, participant types, components, incentives): "PowerForward is a multifaceted energy conservation marketing program designed to reduce peak electricity demand in Utah. The Governor serves as the principle spokesperson for the campaign. The "PowerForward" Campaign maintains an energy "alert network" to provide a color-coded energy status to Utah consumers daily. Each status level is linked to a well-publicized set of easy to understand and implement energy conserving measures that consumers can follow to lower peak electricity demand on the system. Peak electricity demand associated with new summer cooling loads primarily is growing nearly twice as fast as average energy consumption in Utah. The "PowerForward" Campaign promotes purchases of energy efficient cooling devices and adoption of load control measures. The "PowerForward" Campaign actively encourages participation by utilities, commercial, industrial and retail businesses and educators. Energy conservation media releases, consumer information, a website, and promotional events are packaged under the "PowerForward" label to raise consumer awareness and motivate them to respond favorably.			
Program Components:			
Organization name / Contact	Participants	Investment	Energy Savings
1. "PowerForward" Alert Network 2.			90MW during peak hours in 2001

3. 4.			

J. (Reserved)

K. Projection of Visibility Improvement

1. Modeling Scenarios

Improvement in visibility for the 16 Colorado Plateau Class I areas was modeled for two scenarios, the results of which are shown in Tables K.2a and K.2b in Part K of this SIP.

Control Strategies

Scenario 1 is designed to assess the effect of the Grand Canyon Visibility Transport Commission (GCVTC) recommended control strategies, comparing the 1996 modeled base case to the visibility improvement resulting from the implementation of the following GCVTC strategies: the sulfur dioxide Annex Milestones, the regional pollution prevention program, maintenance of existing base smoke management programs, and accounting for the 2018 base case emissions (known and adopted federal, tribal, state, and local control programs in the contiguous WRAP region). Visibility changes resulting from regional implementation of state pollution prevention programs were modeled by the Regional Modeling Center, as part of the other Section 309 control strategies. Visibility changes resulting from implementation of pollution prevention programs by individual states or tribes were not modeled. Emissions changes from state or tribal pollution prevention programs, and the resulting visibility changes are small, based on the regional pollution prevention emissions analysis, but are accounted for in the regional modeling.

Scenario 2 is designed to assess the effect of the implementation of enhanced smoke management programs, as reflected in the WRAP Fire Emissions Joint Forum's 2018 optimal smoke management inventory. Enhanced smoke management programs were recommended by GCVTC and are required in Section 309 of the Regional Haze Rule. This scenario uses the emissions inventories from Scenario 1, except the optimal smoke management inventory was substituted for fire emissions. Thus, the results for Scenario 2 are a comparison of visibility changes resulting from emission reductions between the 2018 baseline smoke management and 2018 optimal smoke management fire inventories.

Modeling results projecting visibility improvement in 2018

Visibility at the 16 Class I areas on the Colorado Plateau was estimated for the 2018 Scenario 1 and Scenario 2 control strategies. Tables K.2a and K.2b display the improvements in visibility from the 1997-2001 baseline period to 2018 under Scenario 1 and 2 conditions for the, respectively, worst 20% and best 20% visibility days. In addition to the projections for the two scenarios, current visibility conditions from 1997-2001, and a projection of 2018 conditions without any 309 programs are also included.

On the average 20% worst visibility days, projected improvement from 1997-2001 to 2018 for Scenario 1 at the 16 Class I areas on the Colorado Plateau ranges from a maximum reduction of 3.92 deciviews at Sycamore Canyon National Park in Arizona to a maximum increase of 1.01 deciviews at San Pedro Parks Wilderness in New Mexico. On the worst 20% days, Scenario 1 shows improving visibility at half and degradation in visibility for the other half of the 16

Colorado Plateau Class I areas. On the average 20% best visibility days, projected change from 1997-2001 to 2018 Scenario 1 ranged from a maximum reduction of 2.15 deciviews at Zion National Park in Utah to a maximum increase of 1.36 deciviews at San Pedro Parks Wilderness Area in New Mexico. On the best 20% days, Scenario 1 improves visibility conditions at three-quarters of the Class I areas on the Colorado Plateau.

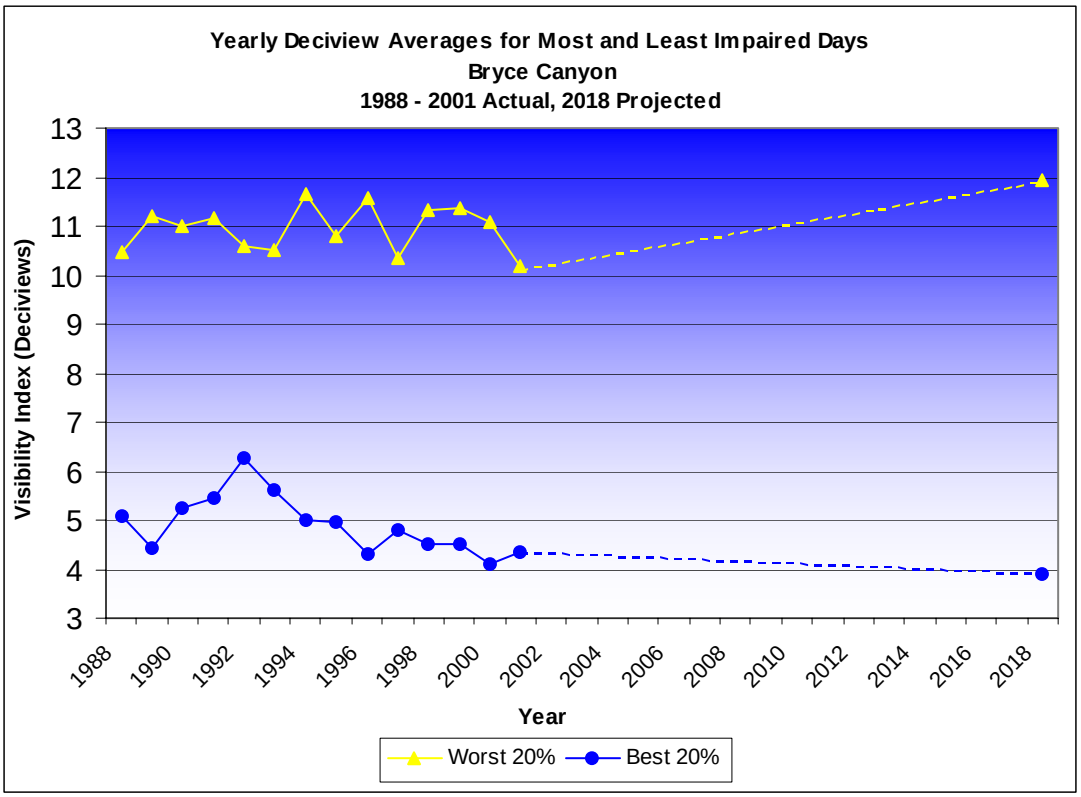
A comparison of the visibility estimates for 2018 Scenarios 1 and 2 at the 16 Class I areas on the Colorado Plateau for the worst 20% (Table K.2a) and best 20% (Table K.2b) days reveals that 2018 Scenario 2 always estimated improved visibility as compared to 2018 Scenario 1. That is, the optimal smoke management programs produces visibility improvements over the base smoke management programs across all 16 Class I areas for both the worst 20% and best 20% days.

2. Visibility Measurements over the Years

The National Park Service conducted visibility monitoring at Utah's parks for many years, but the data is not comparable because improvements in equipment have been made. The only modern data available for a lengthy period is from Bryce and Canyonlands since 1988. IMROVE monitors were installed at Zion and Capitol Reef in 2001, though the Zion monitor was moved to a more appropriate site in the spring of 2003. There is too little data available from those monitors to draw any conclusions about trends in visibility or the sources of visibility impairment.

Displayed below are charts summarizing more than a decade of data from IMPROVE monitors at Bryce and Canyonlands National Parks. Projections of visibility for 2018 have been added.

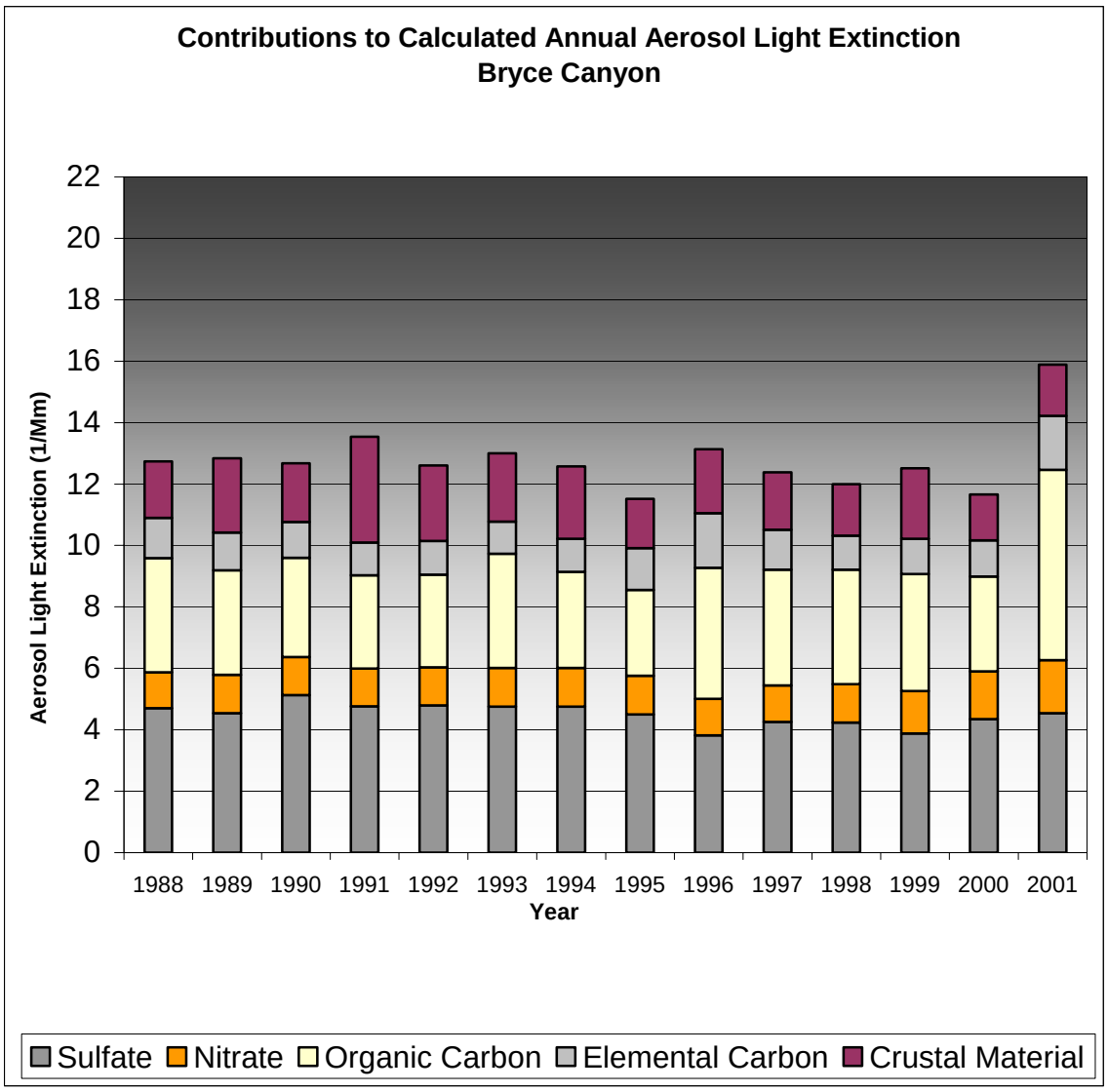
Figure 1 Appendix. Visibility at Bryce Canyon National Park.



Sources: 1988-2001 data from IMPROVE Web site. "Worst 20%" is the 90th percentile day when days are ranked by their visibility. "Best 20%" is the 10th percentile day when days are ranked by their visibility. 2018 is the WRAP-modeled projection found in the TSD.

No clear trend is apparent for the 20% worst days, likely because those days are heavily influenced by both prescribed fire and wildfire. The 20% best days appear to be trending better since 1993 with additional improvement to be achieved from the control strategies in this SIP.

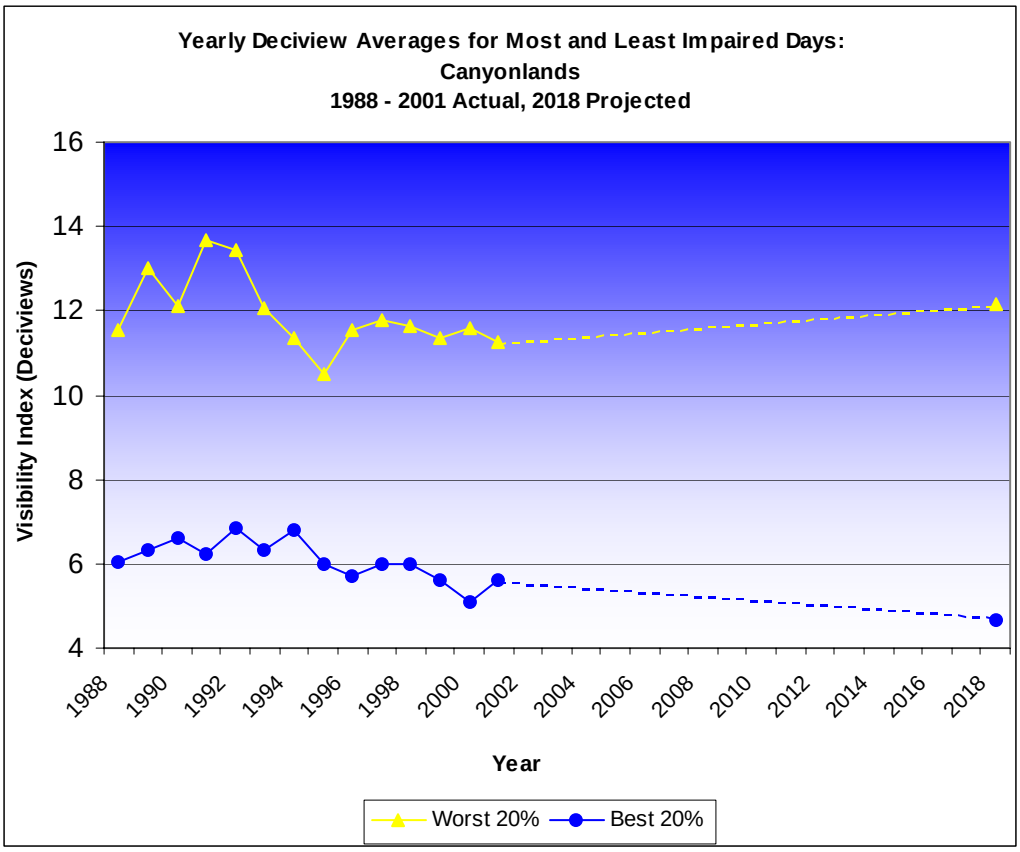
Figure 2 Appendix. Contributions to Light Extinction at Bryce Canyon



Sources: 1988-2001 data from IMPROVE Web site.

The only trend apparent in this chart is the small decline in sulfates over the period. Larger amounts of organic and elemental carbon in 1996 and 2001 are probably attributable to fires.

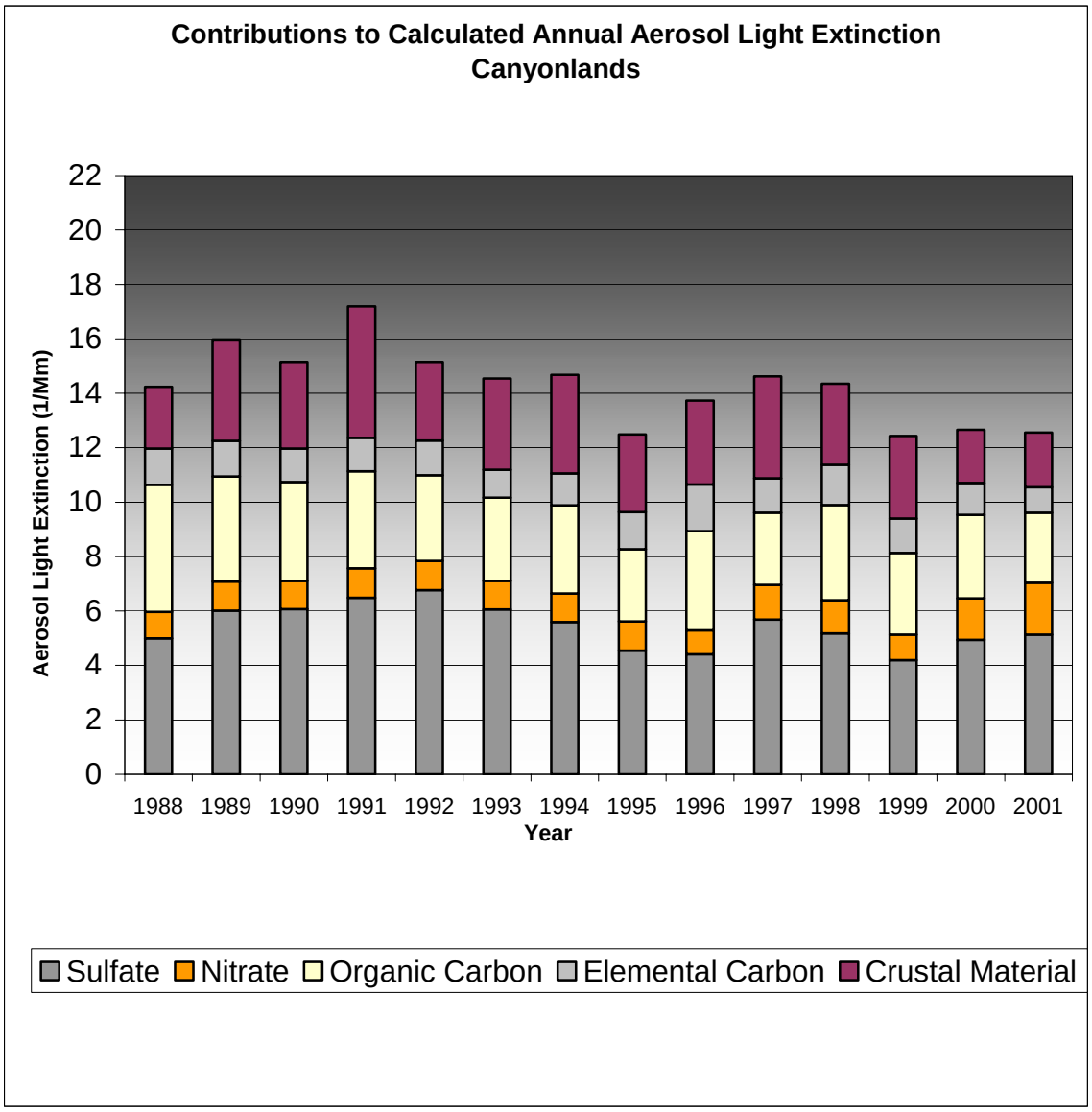
Figure 3 Appendix. Visibility at Canyonlands National Park



Sources: 1988-2001 data from IMPROVE Web site. "Worst 20%" is the 90th percentile day when days are ranked by their visibility. "Best 20%" is the 10th percentile day when days are ranked by their visibility. 2018 is the WRAP-modeled projection found in the TSD.

Both the worst and the best days show improvements in visibility over the period through 2001. The projection for 2018 also shows improvement in the best days.

Figure 4 Appendix. Contributions to Light Extinction at Canyonlands



Sources: 1988-2001 data from IMPROVE Web site.

Again, the chart shows a decline in sulfates over the period and a possible small increase in nitrates.

L. (Reserved)

~~APPENDIX M.~~M. (Reserved)